



THE IMPERIAL ENCYCLOPEDIA AND DICTIONARY

A LIBRARY OF UNIVERSAL
KNOWLEDGE AND AN UN-
ABRIDGED DICTIONARY OF
THE ENGLISH LANGUAGE
UNDER ONE ALPHABET

IN FORTY VOLUMES

VOLUME 7
CALLUS—CHAGRES

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables; ('), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā...mate, fate, fail, aye.....		<i>māt, fāt, fāl, ā.</i>
ă...mat, fat.....		<i>măt, făt.</i>
â...far, calm, father.....		<i>fâr, kâm, fâ'thēr.</i>
ä...care, fair.....		<i>câr, fâr.</i>
aw...fall, laud, law.....		<i>farwl, lawd, law.</i>
ē...mete, meat, feet, free.....		<i>mēt, mēt, fēt, frē.</i>
ě...met, bed.....		<i>mět, bēd.</i>
ê...her, stir, heard, cur.....		<i>hēr, stēr, hērđ, kēr.</i>
î...pine, ply, height.....		<i>pîn, plî, hît.</i>
ĩ...pin, nymph, ability.....		<i>pîn, nîmf, ä-bîl'î-tî.</i>
ō...note, toll, soul.....		<i>nôt, tōl, sōl.</i>
ô...not, plot.....		<i>nôt, plôt.</i>
ó...move, smooth.....		<i>móv, smóth.</i>
õ...Goethe (similar to <i>e</i> in her)...		<i>gõ'teh.</i>
ow...noun, bough, cow.....		<i>noun, bow, kow.</i>
oy...boy, boil.....		<i>boy, boyl.</i>
û...pure, dew, few.....		<i>pûr, dū, fû.</i>
ÿ...bud, come, tough.....		<i>bûd, kûm, tûf.</i>
ú...full, push, good.....		<i>fûl, pûsh, gûd.</i>
ü...French plume, Scotch guid.....		<i>plûm, gûd.</i>
ch...chair, match.....		<i>châr, mäch.</i>
ch...German buch, Heidelberg, Scotch loch (guttural).....		<i>bóch, hî'del-bērçh, löch.</i>
g...game, go, gun.....		<i>gām, gō, gûn.</i>
j...judge, gem, gin.....		<i>jûj, jēm, jîn.</i>
k...king, cat, cot, cut.....		<i>kîng, kât, kôt, kût.</i>
s...sit, scene, cell, city, cypress.....		<i>sît, sēn, sēl, sît'î, sî'prēs.</i>
sh...shun, ambition.....		<i>shûn, äm-bîsh'ûn.</i>
th...thing, breath.....		<i>thîng, brēth.</i>
th...though, breathe.....		<i>thō, brēth.</i>
z...zeal, maze, muse.....		<i>zēl, māz, mûz.</i>
zh...azure, vision.....		<i>äzh'er, vîzh'ûn.</i>

ABBREVIATIONS USED IN THIS WORK.

a., or adj....adjective
A.B.....Bachelor of Arts
abbr.....abbreviation, abbreviated
abl. or abla.ablative
Abp.....Archbishop
abt.....about
Acad.....Academy
acc. or ac..accusative
accom....accommodated, accommodation
act.....active
A.D.....in the year of our Lord [*Anno Domini*]
Adj.Adjutant
Adm.....Admiral
adv. or ad..adverb
A. F.....Anglo-French
Ag.....Silver [*Argentum*]
agri.....agriculture
A. L.....Anglo-Latin
Al.....Aluminium
Ala.....Alabama
Alb.....Albanian
alg.....algebra
A.M.....before noon [*ante meridiem*]
A.M.Master of Arts
Am.....Amos
Amer.....America, -n
anat.....anatomy, anatomical
anc.....ancient, anciently
A.N. M.in the year of the world [*Anno Mundi*]
anon.....anonymous
antiqu.....antiquity, antiquities
aor.....aorist, -ic
app.....appendix
appar.....apparently
Apr.....April
Ar.....Arabic
arch.....architecture
archæol...archæology
arith.....arithmetic
Ariz.....Arizona
Ark.....Arkansas
art.....article
artil.....artillery
AS.....Anglo-Saxon
As.....Arsenic
Assoc.....Association
asst.....assistant
astrol.....astrology
astron... ..astronomy
attrib.....attributive
atty.....attorney
at. wt.....atomic weight
Au.....Gold [*Aurum*]

A.U.C.....in the year of the building of the city (Rome)[*Anno Urbis conditæ*]
Aug.....August
aug.....augmentative
Aust.....Austrian
A. V.....authorized version [of Bible, 1611]
avoir.....avoids
B.....Boron
B.....Britannic
b.....born
Ba.....Barium
Bart.....Baronet
Bav.....Bavarian
bl.; bbl....barrel; barrels
B.C.....before Christ
B.C.L.....Bachelor of Civil Law
B.D.....Bachelor of Divinity
bef.....before
Belg.....Belgic
Beng.....Bengali
Bi.....Bismuth
biog.....biography, biographical
biol.....biology
B.L.....Bachelor of Laws
Bohem....Bohemian
bot.....botany, botanical
Bp.....Bishop
Br.....Bromine
Braz.....Brazilian
Bret.....Breton
Brig.....Brigadier
Brit.....British, Britannica
bro.....brother
Bulg.....Bulgarian
bush.....bushel, bushels
C.....Carbon
c.....century
Ca.....Calcium
Cal.....California
Camb.....Cambridge
Can.....Canada
Cant.....Canterbury
cap.....capital
Capt.....Captain
Card.....Cardinal
carp.....carpentry
Cath.....Catholic
caus.....causative
cav.....cavalry
Cd.....Cadmium
Ce.....Cerium
Celt.....Celtic
cent.....central
cf.....compare [*confer*]
ch or chh...church

ABBREVIATIONS.

Chal.....	Chaldee	diff.....	different, difference
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist	district
Chin.....	Chinese	distrib... ..	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D...	Dutch
co.....	county	dwt	pennyweight
cog.....	cognate [with]	dynam or	
Col.....	Colonel	dyn.....	dynamics
Col.....	Colossians	E.....	Erbium
Coll.....	College	E. or e.....	East, -ern, -ward
colloq.....	colloquial	E. or Eng.	English
Colo.....	Colorado	Eccl.....	Ecclesiastes
Com.....	Commodore	eccl. or	{ ecclesiastical [af- eccles.... } fairs]
com.....	commerce, commer- cial	ed	
com.....	common	ed	edited, edition, edi- tor
comp.....	compare	e.g.....	for example [ex gratia]
comp.....	composition, com- pound	E. Ind. or {	East Indies, East E. I.... } Indian
compar....	comparative	elect.....	
conch.....	conchology	Emp.	Emperor
cong.....	congress	Encyc.....	Encyclopedia
Congl.....	Congregational	Eng. or E..	English
conj	conjunction	engin.....	engineering
Conn or Ct.	Connecticut	entom	entomology
contr.....	contraction, con- tracted	env. ext....	envoy extraordinary
Cop.....	Coptic	ep.....	epistle
Cor.....	Corinthians	Eph	Ephesians
Corn.....	Cornish	Episc	Epi-copal
corr.....	corresponding	eq. or =...	equal, equals
Cr	Chromium	equiv.....	equivalent
crystal.....	crystallography	esp.....	especially
Cs	Cæsium	Est	Esther
ct.....	cent	estab.....	established
Ct. or Conn.	Connecticut	Esthon....	Esthonian
Cu.....	Copper [<i>Cuprum</i>]	etc.....	and others like [<i>et cetera</i>]
cwt.....	a hundred weight	Eth.....	Ethiopic
Cyc.....	Cyclopedia	ethnog....	ethnography
D.....	Didymium	ethnol.....	ethnology
D. or Dut..	Dutch	et seq.....	and the following [<i>et sequentia</i>]
d.....	died	etym.....	etymology
d. [l. s. d.]	penny, pence	Eur.....	European
Dan.....	Daniel	Ex.....	Exodus
Dan.....	Danish	exclam....	exclamation
dat	dative	Ezek.....	Ezekiel
dau.....	daughter	Ezr.....	Ezra
D. C.....	District of Columbia	F.....	Fluorine
D.C.L.....	Doctor of Civil [or Common] Law	F. or Fahr.	Fahrenheit
D.D.....	Doctor of Divinity	f. or fem...	feminine
Dec.....	December	F. or Fr...	French
dec.....	declension	fa.....	father
def.....	definite, definition	Fahr. or F.	Fahrenheit
deg.....	degree, degrees	far.....	farriery
Del.....	Delaware	Fe.....	Iron [<i>Ferrum</i>]
del.....	delegate, delegates	Feb.....	February
dem.....	democratic	fem or f. .	feminine
dep.....	deputy	fig.....	figure, figuratively
dep.....	deponent	Fin.....	Finnish
dept.....	department	F.—L.....	French from Latin
deriv.....	derivation, deriva- tive	Fla.....	Florida
Deut.....	Deuteronomy	Flem.....	Flemish
dial.....	dialect, dialectal	for.....	foreign
diam....	diameter	fort.....	fortification
Dic.....	Dictionary	Fr. or F...	French
		fr.....	from

ABBREVIATIONS.

freq.....frequentative	ind.....indicative
Fris.....Frisian	indef.....indefinite
ft.....foot, feet	Indo-Eur...Indo-European
fut.....future	inf.....infantry
G. or Ger...German	inf or infin.infinite
G.....Glucinium	instr.....instrument, -al
Ga.....Gallium	int... ..interest
Ga.....Georgia	intens.....intensive
Gael.....Gaelic	interj. or
Gal.....Galatians	int.....interjection
gal.....gallon	interrog...interrogative pro-
galv.....galvanism, galvanic	noun
gard.....gardening	intr. or
gen.....gender	intrans...intransitive
Gen.....General	Io... ..Iowa
Gen.....Genesis	Ir..... ..Iridium
gen.....genitive	Ir..... ..Irish
Geno.....Genoesæ	Iran.....Iranian
geog.....geography	irr.....irregular, -ly
geol.....geology	Is..... ..Isaiah
geom.....geometry	It..... ..Italian
Ger.....German, Germany	Jan.....January
Goth.....Gothic	Jap.....Japanese
Gov.....Governor	Jas.....James
govt.....government	Jer.....Jeremiah
Gr.....Grand, Great	Jn.....John
Gr.....Greek	Josh.....Joshua
gr.....grain, grains	Jr.....Junior
gram.....grammar	Judg.....Judges
Gr. Brit....Great Britain	K.....Potassium [<i>Kalium</i>]
Gris.....Grisons	K.....Kings [in Bible]
gun.....gunnery	K.....king
H.....Hegira	Kan.....Kansas
H.....Hydrogen	Kt.....Knight
h.....hour, hours	Ky.....Kentucky
Hab.....Habakkuk	L.....Latin
Hag.....Haggai	L.....Lithium
H. B. M....His [or Her] Britan- nic Majesty	l. [l. s. d.], } pound, pounds or £..... } [sterling]
Heb.....Hebrew, Hebrews	La.....Lanthanum
her.....heraldry	La.....Louisiana
herpet.....herpetology	Lam.....Lamentations
Hg.....Mercury [<i>Hydrar-</i> <i>gyrum</i>]	Lang.....Languedoc
hhd.....hogshead, hogsheads	lang... ..language
Hind.....Hindustani, Hindu, or Hindi	Lap.....Lapland
hist.....history, historical	lat.....latitude
Hon.....Honorable	lb.; lb. or } pound; pounds lbs..... } [weight]
hort.....horticulture	Let.....Lettish
Hos.....Hosea	Lev.....Leviticus
Hung.....Hungarian	LG.....Low German
Hydros.....Hydrostatics	L.H.D.....Doctor of Polite Lit- erature
I.....Iodine	Lieut.....Lieutenant
I; Is.....Island; Islands	Lim.....Limousin
Icel.....Icelandic	Lin.....Linnaeus, Linnæan
ichth.....ichthyology	lit.....literal, -ly
Ida.....Idaho	lit.....literature
i.e.....that is [<i>id est</i>]	Lith.. ..Lithuanian
Ill.....Illinois	lithog.....lithograph, -y
illus.....illustration	LL.....Late Latin, Low Latin
impera or	LL.D.....Doctor of Laws
impr.....imperative	long.....longitude
impers.....impersonal	Luth.....Lutheran
impf or imp.imperfect	M.....Middle
impf. p. or	M.. ..Monsieur
imp.....imperfect participle	m.. ..mile, miles
improp.....improperly	m. or masc.masculine
In.....Indium	M.A.....Master of Arts
in... ..inch, inches	Macc.....Maccabees
incept.....inceptive	mach... ..machinery
Ind.....India, Indian	Mag.....Magazine
Ind.....Indiana	

ABBREVIATIONS.

Maj.....Major
 Mal.....Malachi
 Mal.....Malay, Malayan
 manuf.....manufacturing,
 manufacturers
 Mar.....March
 masc or m.....masculine
 Mass.....Massachusetts
 math.....mathematics, math-
 ematical
 Matt.....Matthew
 M.D.....Doctor of Medicine
 MD.....Middle Dutch
 Md.....Maryland
 ME.....Middle English, or
 Old English
 Me.....Maine
 mech.....mechanics, mechan-
 ical
 med.....medicine, medical
 mem.....member
 mensur.....mensuration
 Messrs. or
 MM.....Gentlemen, Sirs
 metal.....metallurgy
 metaph.....metaphysics, meta-
 physical
 meteor.....meteorology
 Meth.....Methodist
 Mex.....Mexican
 Mg.....Magnesium
 M.Gr.....Middle Greek
 MHG.....Middle High Ger-
 man
 Mic.....Micah
 Mich.....Michigan
 mid.....middle [voice]
 Milan.....Milanese
 mid. L. or { Middle Latin, Me-
 ML.....{ diæval Latin
 milit. or
 mil.....military [affairs]
 min.....minute, minutes
 mineral.....mineralogy
 Minn.....Minnesota
 Min. Plen..Minister Plenipoten-
 tiary
 Miss.....Mississippi
 ML or { Middle Latin, Me-
 mid. L...{ diæval Latin
 MLG.....Middle Low German.
 Mlle.....Mademoiselle
 Mme.....Madam
 Mn.....Manganese
 Mo.....Missouri
 Mo.....Molybdenum
 mod.....modern
 Mont.....Montana
 Mr.....Master [Mister]
 Mrs.....Mistress [Missis]
 MS.; MSS..manuscript; manu-
 scripts
 Mt.....Mount, mountain
 mus.....music
 MUS.DOC...Doctor of Music
 myth.....mythology, mytho-
 logical
 N.....Nitrogen
 N. or n.....North, -ern, -ward
 n.....noun
 n or neut...neuter
 Na.....Sodium [*Natrium*]
 Nah.....Nahum

N. A., or
 N. Amer.North America, -n
 nat.....natural
 naut.....nautical
 nav.....navigation, naval af-
 fairs
 Nb.....Niobium
 N. C. or
 N. Car...North Carolina
 N. D.....North Dakota
 Neb.....Nebraska
 neg.....negative
 Neh.....Nehemiah
 N. Eng.....New England
 neut or n.....neuter
 Nev.....Nevada
 N.Gr.....New Greek, Modern
 Greek
 N. H.....New Hampshire
 NHG.....New High German
 [German]
 Ni.....Nickel
 N. J.....New Jersey
 NL.....New Latin, Modern
 Latin
 N. Mex.....New Mexico
 N. T., or
 N. Test...New Testament
 N. Y.....New York [State]
 nom.....nominative
 Norm. F...Norman French
 North. E...Northern English
 Norw...Norwegian, Norse
 Nov.....November
 Num.....Numbers
 numis.....numismatics
 O.....Ohio
 O.....Old
 O.....Oxygen
 Obad.....Obadiah
 obj.....objective
 obs. or †...obsolete
 obsoles.....obsolescent
 O.Bulg.....Old Bulgarian or Old
 Slavic
 Oct.....October
 Odontog...odontography
 OE.....Old English
 OF or
 O. Fr....Old French
 OHG.....Old High German
 Ont.....Ontario
 opt.....optics, optical
 Or.....Oregon
 ord.....order
 ord.....ordnance
 org.....organic
 orig.....original, -ly
 ornith.....ornithology
 Os.....Osmium
 OS.....Old Saxon
 O. T., or
 O. Test...Old Testament
 Oxf.....Oxford
 oz.....ounce, ounces
 P.....Phosphorus
 p.; pp.....page; pages
 p., or part..participle
 Pa. or Penn.Pennsylvania
 paint.....painting
 palæon.....palæontology
 parl.....parliament
 pass.....passive

ABBREVIATIONS.

pathol or
 path.....pathology
 Pb.....Lead [*Plumbum*]
 Pd.....Palladium
 Penn or Pa.Pennsylvania
 perf.....perfect
 perh.....perhaps
 Pers.....Persian, Persic
 pers.....person
 persp.....perspective
 pert.....pertaining [to]
 Pet.....Peter
 Pg. or Port.Portuguese
 phar.....pharmacy
 PH.D.....Doctor of Philoso-
 phy
 Phen.....Phenician
 Phil.....Philippians
 Philem.....Philemon
 philol.....philology, philologi-
 cal
 philos. { philosophy, philo-
 or phil... } sophical
 phonog....phonography
 photog....photography
 phren.....phrenology
 phys.....physics, physical
 physiol....physiology, physi-
 ological
 Pied.....Piedmontese
 Pl.....Plate
 pl. or plu...plural
 Pl. D.....Platt Deutsch
 plupf.....pluperfect
 P.M.....afternoon [*post meri-
 diem*]
 pneum....pneumatics
 P. O.....Post-office
 poet.....poetical
 Pol.....Polish
 pol. econ...political economy
 polit.....politics, political
 pop.....population
 Port. or Pg.Portuguese
 poss.....possessive
 pp.....pages
 pp.....past participle, per-
 fect participle
 p. pr.....present participle
 Pr. or Prov.Provengal
 pref.....prefix
 prep.....preposition
 Pres.....President
 pres.....present
 Presb.....Presbyterian
 pret.....preterit
 prim.....primitive
 priv.....privative
 prob.....probably, probable
 Prof.....Professor
 pron.....pronoun
 pron.....pronunciation, pro-
 nounced
 prop.....properly
 pros.....prosody
 Prot.....Protestant
 Prov. or Pr.Provengal
 Prov.....Proverbs
 prov.....province, provincial
 Prov. Eng..Provincial English
 Prus.....Prussia, -n
 Ps.....Psalm, Psalms
 psychol....psychology

pt.....past tense
 pt.....pint
 Pt.....Platinum
 pub.....published, publisher,
 publication
 pwt.....pennyweight
 Q.....Quebec
 qt.....quart
 qtr.....quarter [weight]
 qu.....query
 q.v.....which see [*quod
 vide*]
 R.....Rhodium
 R.....River
 Rb.....Rubidium
 R. Cath....Roman Catholic
 rec. sec....recording secretary
 Ref.....Reformed
 refl.....reflex
 reg.....regular, -ly
 regt.....regiment
 rel. pro. or
 rel.....relative pronoun
 repr.....representing
 repub.....republican
 Rev.....Revelation
 Rev.....The Reverend
 Rev. V.....Revised Version
 rhet.....rhetoric, -al
 R. I.....Rhode Island
 R. N.....Royal Navy
 Rom.....Roman, Romans
 Rom.....Romanic or Ro-
 mance
 Rom. Cath. { Roman Catholic
 Ch. or R. } Church
 C. Ch.... }
 r.r.....railroad
 Rt. Rev...Right Reverend
 Ru.....Ruthenium
 Russ.....Russian
 r.w.....railway
 S.....Saxon
 S.....Sulphur
 s.....second, seconds
 s. [l. s. d.]..shilling, shillings
 S. or s.....South, -ern, -ward
 S. A. or
 S. Amer..South America, -n
 Sam.....Samaritan
 Sam.....Samuel
 Sans, or
 Skr.....Sanskrit
 Sb.....Antinony [*Stibium*]
 s.c.....understand, supply,
 namely [*scilicet*]
 S. C. or
 S. Car....South Carolina
 Scand.....Scandinavian
 Scot.....Scotland, Scotch
 scr.....scruple, scruples
 Scrip.....Scripture [s], Scrip-
 tural
 sculp.....sculpture
 S. D.....South Dakota
 Se.....Selenium
 sec.... secretary
 sec.....section
 Sem.....Semitic
 Sep.....September
 Serv.....Servian
 Shaks.....Shakespeare
 Si.....Silicon

ABBREVIATIONS.

Sic.....	Sicilian	trigon.....	trigonometry
sing.....	singular	Turk.....	Turkish
sis.....	sister	typog.....	typography, type
Skr. or			graphical
Sans.....	Sanskrit	U.....	Uranium
Slav.....	Slavonic, Slavic	ult.....	ultimate, -ly
Sn.....	Tin [<i>Stannum</i>]	Unit.....	Unitarian
Soc.....	Society	Univ.....	Universalist
Song Sol...	Song of Solomon	Univ.....	University
Sp.....	Spanish	U. Presb...	United Presbyterian
sp. gr.....	specific gravity	U. S.....	United States
sq.....	square	U. S. A.....	United States Army
Sr.....	Senior	U. S. N.....	United States Navy
Sr.....	Strontium	Ut.....	Utah
St.: Ste....	Saint	V.....	Vanadium
St..	street	v.....	verb
stat.....	statute	Va.....	Virginia
s.T.D.....	Doctor of Sacred Theology	var.....	variant [word]
subj.....	subjunctive	var.....	variety of [species]
suf.....	suffix	Ven.....	Venerable
Su. Goth...	Suo-Gothic	Venet.....	Venetian
superl.....	superlative	vet....	veterinary
Supp.....	Supplement	v. i. or	
Supt.....	Superintendent	v. intr....	verb intransitive
surg.....	surgery, surgical	vil.....	village
Surv.....	surveying	viz.....	namely, to-wit [<i>vidē licet</i>]
Sw.....	Swedish	v. n.....	verb neuter
Swab.....	Swabian	voc.....	vocative
sym.....	symbol	vol.....	volume
syn.....	synonym, -y	vols.....	volunteers
Syr.....	Syriac, Syrian	Vt.....	Vermont
t.....	town	v. tr.....	verb transitive
Ta... ..	Tantalum	W.....	Tungsten [<i>Wolfram</i>]
Tart.....	Tartar	W.....	Welsh
Te.....	Tellurium	W. or w....	West, -ern, -ward
technol...	technology	Wal.....	Walachian
teleg.....	telegraphy	Wall.....	Walloon
Tenn.....	Tennessee	Wash.....	Washington
term.....	termination	Westph...	Westphalia, -n
terr.....	territory	W. Ind. }	West Indies, West
Teut.....	Teutonic	or W. I... }	Indian
Tex.....	Texas	Wis.....	Wisconsin
Th.....	Thorium	wt.....	weight
theat.....	theatrical	W. Va.....	West Virginia
theol.....	theology, theological	Wyo.....	Wyoming
therap.....	therapeutics	Y.....	Yttrium
Thess.....	Thessalonians	yd.....	yard
Ti.....	Titanium	yr.....	year
Tim.....	Timothy	Zech.....	Zechariah
Tit.....	Titus	Zeph.....	Zephaniah
Tl.....	Thallium	Zn.....	Zinc
toxicol....	toxicology	zool.....	zoology, zoological
tp.....	township	Zr.....	Zirconium
tr. or trans.	transitive		
transl.....	translation, trans-		
	lated		

See also ABBREVIATIONS: in Vol. I.

THE IMPERIAL CYCLOPEDIA AND DICTIONARY.

CAL'LUS, in Surgery: term in old surgical works, and still used popularly, to indicate the exuded material by which fractures of bone are consolidated together. If the broken ends are accurately adjusted to each other, there is no projection of C., but merely a slight deposition of it between the two surfaces; if, however, the adjustment is not accurate, the C. is effused in such quantity as to fill up any interspaces that may exist, and as often to form a considerable hard swelling round the seat of the fracture; any excess is, however, usually absorbed during the last stage of the repair of a fracture. When the broken ends are allowed to move upon each other—which, of course, should always be prevented, if possible—a ferrule of new bone, encircling both fragments for some little distance, so as to splice them together, till they are united by a permanent C., is formed; this is termed a *provisional callus*.

CALM, a. *kâm* [F. *calme*—from It., Sp. *calma*, absence of wind, quiet: Gael. *calm*, and *calma*, brave, cool, resolute]: not subjected to disturbance or excitement; still; quiet; tranquil; undisturbed: N. stillness; quiet; repose; freedom from agitation or motion: V. to still; to quiet; to free from agitation; to pacify; to tranquilize. **CALM'ING**, imp. **CALMED**, pp. *kâmd*. **CALM'ER**, n. one who. **CALM'LY**, ad. -*lî*, in a quiet, undisturbed manner; serenely; without excitement. **CALM'NESS**, n. the state or quality of being in quietness; serenity. **CALMY**, a. *kâm'î*, in *OE.*, still; quiet. **DEAD CALM**, a calm without a movement in air or a ruffle on sea; a perfect stillness.—**SYN.** of 'calm, a.': still; quiet; serene; tranquil; peaceful: placid; settled; composed; collected; undisturbed; unruffled; sedate;—of 'calm, v.', to lull; appease; still; quiet; assuage; tranquilize.

CALMAR: see **KALMAR**.

CALMET, *kâi-mâ'*, **AUGUSTINE**: exegetical and historical writer, and learned Benedictine: 1672, Feb. 26—1757, Oct. 25; b. Mesnil-la-Horgue, near Commercy, France. In 1689 he entered the order of Benedictines. In 1698 he was appointed teacher of philosophy and theology in the Abbey Moyen-Moutier; in 1704 sub-prior of a convent of learned monks at Münster, Alsace; and 1706 he went to

CALMS—CALOMARDE.

Paris, to superintend the publication of his *Commentary on the Bible*. He was afterward appointed prior at Lay (1715), Abbot of St. Leopold (1718), Abbot of Senones in Lorraine (1728); and died at Paris. His exegetical writings have been studied with advantage by both Roman Catholics and Protestants. The *Commentary on the Bible* (23 vols., Paris, 1707-16) though marked by the author's deficient knowledge of the oriental languages, contains valuable researches in biblical antiquities. C.'s *Historical and Critical Dictionary of the Bible* (4 vols., Paris, 1722-28) was translated into English, German, and other languages, and has passed through many editions. His other works—a *History of the Bible*, and of the *Jews* (1718), and a *Universal History* (1735-71)—are mere compilations; but his *History of Lorraine* is founded on original researches. His learning in some departments was great; but solid criticism and vigorous intellect are wanting in all his works.

CALMS, or **CALM LATITUDES**: those parts of the ocean, near the equator, which are subject to total absence of wind for long periods. The part of the ocean where C. are most looked for, is between the region of the trade-winds and that of the variable winds: see **WINDS**. It is almost as much dreaded by seamen as a region of storms, for the ship is unnavigable; and during a calm of many weeks, food and water may be nearly exhausted, at a point too far from land for boats to reach it. Where a calm occurs unexpectedly, it is likely to be followed by violent storms.

CALMUC, or **CALMUCK**, or **KALMUC**, a. n. *kāl'mūk*: applied to a tribe of Mongols in Tartary, and near the Volga, Russia. See **KALMUCKS**.

CALNE, *kân*: an old-fashioned market-town of Wiltshire, England, on the river Marden, 31 m. n.n.w. of Salisbury. It lies in one of the many valleys in the chalk escarpment of this part of England, with the plateau of the Marlborough Downs and Salisbury Plain on the e. and s. In 1863, a branch line was opened to C., six m. from the Chippenham station of the Great Western railway. The principal industry is the curing of bacon. The manufacture of woollens, formerly important, is now almost extinct. It has a grammar school (1660) and town hall (1882). Roman remains have been found here. The West-Saxon kings had a palace at C., but no traces of it remain. At a synod held here by St. Dunstan 977, relative to the celibacy of the clergy, the floor of the room in which the synod sat gave way, precipitating all to the ground but St. Dunstan, who presided. On an almost perpendicular declivity 3 m. e. of C. is the figure of a *horse*, 157 ft. long, in a spirited attitude. It was cut out in white chalky ground in 1780 by Dr. Allsopp, and is visible 50 m. away. C. ceased to be a parliamentary borough 1885. Pop. (1891) 3,495.

CALO'EE: see **BOEHMERIA**.

CALOMARDE, *kä-lo-mâr'da*, **DON FRANCISCO TADEO**, Count: 1775-1842; b. Vilel, in Aragon. He studied at Saragossa, where he passed as advocate. After the expul-

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sion of the French, and the return of Ferdinand VII. 1814, C. was among the first to hurry to Aragon, and do homage to him as an absolute monarch. As a reward of his obsequious celerity, he obtained the highest office in the *Secretaria General de Indias*, but lost it on account of accepting a bribe. On the restoration of the constitution 1820, he unsuccessfully courted the favor of the liberals; but when the French army in 1823 enabled the king once more to rule despotically, C. was appointed sec. of the *Cámara del Real Patronato*, one of the most influential offices in the kingdom. Not long afterward, the king made him minister of justice. While he held this function, he persecuted the liberals with cold-blooded savageness, recalled the Jesuits, reopened the monasteries, and closed the universities. He also secretly favored the party of Don Carlos; but, on the other hand, by treating any unseasonable outbreak with a strictness bordering on cruelty, he preserved himself from the suspicion of being implicated in their schemes. In 1833, when Ferdinand was supposed to be on his death-bed, he was prevailed on by C. to reintroduce the Salic Law, by which Christina was excluded from the throne, and Don Carlos, the favorite of the absolutists, appointed his successor. This excited the hatred of the nation; Ferdinand recovering, abolished the law, and to avoid imprisonment, C. fled to France, and died at Toulouse.

CALOMEL, n. *kāl'ō-mēl* [Gr. *kalos*, beautiful; *melas*, black—*lit.*, a beautiful product from a black substance]: popular name of one of the compounds of mercury (Hg) and chlorine (Cl), used in medicine; known to chemists as the subchloride of mercury (HgCl). It is prepared by taking two equal portions of mercury, dissolving one portion in hot concentrated sulphuric acid (SO₃), which forms sulphate of mercury (HgOSO₃), thereafter adding the second part of the metal, and triturating the whole in a mortar till the metal becomes incorporated with the sulphate of mercury. This mixture is then added to one-half its weight of common salt (NaCl), and heated in a retort, when C. sublimes, and condenses in the cool part of the receiver, as a fine white powder. A minute portion of corrosive sublimate which accompanies it, is removed by washing with water. C. is very dense. It is not soluble in water, and sparingly so in acids. It turns black on the addition of lime-water, potash, soda, or ammonia; and when heated in an iron spoon, or on a knife, it does not char, but rises in vapor, sublimes unaltered, and readily condenses again on any cool surface held near it. Although C. has been used probably more than any other preparation of mercury, it is not known to have been employed before the 17th c. For its medicinal virtues, see MERCURY.

CALONNE, *ká-lōn'*, CHARLES ALEXANDRE DE, Controller General of Finance in France under Louis XVI.: 1734, Jan. 20—1802, Oct. 30; b. Douay. Possessing superior abilities, he studied law, and having filled successively various offices, was made, 1783, controller-gen. of the treasury. In this capacity he soon gained favor among the

CALOPHYLLUM.

courtiers, who had complained of the parsimony of Turgot and Necker. C., though he found French finances in a deplorable state, was determined not to *seem* poor, gave brilliant entertainments, paid off the debts of his patron, the Count of Artois, supplied the queen with sufficient pocket-money, granted pensions and gratuities to his supporters and favorites, paid off arrears, and purchased the residences of St. Cloud and Rambouillet. His means of raising money were perfectly simple—he borrowed, anticipated, issued chancery-edicts, and prolonged and augmented extraordinary taxations in a style never known before. The parliament resisted these measures, but C., backed by royal authority, carried them into execution. The crisis necessarily arrived; and in 1786, when the people could bear the extraordinary taxation no longer, C. advised the king to convoke the assembly of the notables, and proposed to abolish the privileges (exemption from taxes) of the noble and wealthy, to take the duty off salt, to abolish *socage* (feudal or compulsory service to the lord of the manor), and to distribute the burden of taxation more equally. The people and the aristocracy demanded a convocation of the states general, instead of the assembly of the notables; but C. boldly proceeded with his plan, opened the assembly of the notables, 1787, Feb. 2, and in a pleasant and florid oration, described the general prosperity of French industry and commerce, and brought his speech to a climax by confessing that the annual deficit of the treasury had risen to 115 millions of francs, and that from 1776 to 1786, the government had borrowed no less a sum than about 1,250 millions! The notables, instead of proceeding with C.'s plan of reorganization, demanded from him a statement of accounts. Not being able to give this satisfactorily, he was stripped of his dignities, and banished to Lorraine. After this, C. resided chiefly in England, until in 1802 he obtained from Bonaparte permission to return to France, where he died, in very embarrassed circumstances.

CALOPHYLLUM, *kāl-ō'fīl'ŭm* [Gr., beautiful leaf]: genus of trees of the nat. ord. *Guttiferæ* (q.v.), natives of warm climates. Some of the species yield valuable timber, as *C. angustifolium*, the PINEY TREE, which grows at Penang, and in the islands eastward of the Bay of Bengal, and furnishes the beautiful straight spars called *Peon*. The resinous products of some species are valuable, and among them are some of the substances known by the name of TACAMAHACA (q.v.). *C. Inophyllum*, which yields true East Indian Tacamahaca, is a very large and beautiful umbrageous tree, often planted for its shade and the fragrance of its flowers, which are white and in loose axillary racemes. It is one of the most valuable timber-trees of the South Sea Islands. The timber resembles mahogany, being of equally close texture, though of lighter color, and very durable. The leaves are oblong and obtuse; the fruit—which in all this genus is a globose drupe or stone fruit—is about the size of a walnut; and a fixed oil is expressed from its kernel, which is used for lamps, etc. A similar oil is expressed from the seed of *C. Calaba*, the CALABA

CALORIC—CALORIC ENGINE.

TREE of the West Indies, which also has white sweet-scented flowers, and of which the timber is used for various purposes, particularly for staves and cask-headings.

CALORIC, n. *kă-lôr'ik* [L. *calor*, heat: F. *calorique*: It. *calore*]: the cause or matter which was supposed to produce heat; used also for 'heat,' but improperly (see HEAT). CALORIF'IC, a. -*îf'ik* [L. *faciō*, I make]: causing heat. CALOR'IFICA'TION, n. -*î-kă'shŭn*. CALORIDUCT, *ka-lôr'î-dŭkt*, [L. *ductus*, a leading]: a pipe or passage for conducting heat. CALORIFERE, n. *kă-lôr'î-fēr* [F.—from L. *calor*, heat; *ferrē*, to bring]: an apparatus for conveying and distributing heat, particularly in conservatories. CAL'ORIM'-ETER, n. -*îm'ě-tēr* [L. *calor*, heat; Gr. *metron*, a measure]; an apparatus for measuring the heat contained in bodies (see HEAT). CALORIMO'TOR, -*mō'tēr*, a galvanic instrument for evolving heat.

CALORIC ENGINE: name given by Capt. Ericsson to his latest *air-engine*. Though there seems no reason for this change of name, except perhaps for distinction of this engine from previous unsuccessful air-engines, yet as the name is in use, air-engine and caloric engine may be here treated as synonymous terms.

It is a well-known law, applicable to all thermo-dynamic engines, that (presupposing the merely mechanical part of the machine to be perfect) the heat converted into work bears the same proportion to the total heat given to the fluid that the range of temperature bears to the highest *absolute* temperature of the fluid. Thus supposing an engine to receive steam* at the temperature of 275° F., and discharge it at that of 120° F., the fraction of heat which it can convert into work will be $\frac{275 - 120}{275 + 461}$ or about 21 per cent. of the total heat of the fluid. This proportion would be, of course, greatly reduced in practice, owing to imperfections in the machinery, but these being equally likely to occur in all prime movers, need not be considered here. The *lowest* limit of temperature available being practically constant, fixed either by the temperature of the atmosphere, or that obtainable in a condenser; it follows that greater economy can be looked for only in the direction of increase of initial temperature. In ordinary steam-engines, in which the pressure and temperature increase simultaneously, the latter is limited by the former, which in its turn is kept, by considerations of safety, comparatively low. When, however, *superheated* steam (steam to which additional heat has been imparted without the corresponding addition of pressure) or heated air is used, the temperature is limited only by the power of the metals composing the machine to resist the destructive action of heat, or the chemical action of the fluid at that temperature. Heated air possesses the advantage over superheated steam as a motive power, that with it an explosion, in the usual sense of the word, is rendered almost impossible, and that,

* The law is the same for steam, air, or any other fluid whatever.

CALORIC ENGINE.

if one were to occur, it would be comparatively harmless. It also, of course, enables the boiler to be dispensed with.

Air-engines, in their principal working parts, are very similar to ordinary steam-engines. The heated air is introduced into a cylinder, in which works a tightly-fitting piston, which is thus compelled to move up and down, and transfer its motion to a revolving shaft by means of a piston and connecting-rod in the usual manner. The motion of the piston results in all cases from the expansion of the heated air; the air is heated by means of a furnace, is introduced below the piston, raises it, and then is allowed to escape into the atmosphere. Air-engines are almost invariably single-acting; they are sometimes worked simply by heated air, and sometimes with the air which, having passed through the furnace, is mixed with all the gaseous products of combustion. The latter method has the immense advantage that it utilizes the heat which would otherwise be rejected into the chimney. The total efficiency of the machine is thus increased, although the efficiency of the engine proper, between the given pair of temperatures, remains the same.

The more heat carried away by the discharged air—the higher its temperature, in other words—the smaller evidently is, *ceteris paribus*, the range of temperature of the machine and the less, therefore (as already explained), will be its efficiency. The distinctive principle of the Messrs. Stirling's air-engine, as of the later C. E., consists in utilizing a great part of this wasted heat, and thus economizing fuel. This is effected by means of a 'regenerator,' or, more properly, 'economizer,' consisting of a chamber filled with metallic sieves of wire-gauze, through which the hot air is made to pass *outward* from the cylinder, after having performed its work on the working-piston of the engine. As much of the heat of the escaping air is taken up by the regenerator, and its temperature thus reduced, the range of temperature of the machine is correspondingly increased. The fresh air entering the cylinder for the next stroke was compelled to pass *inward* through the regenerator, and abstracted from it the heat left in it. In this way it did not require to receive so much heat in the furnace as would otherwise have been the case, and thus it economized fuel.

This method of preventing waste of heat was first discovered by the Rev. Dr. Stirling, who obtained a patent for it 1816. In working with air at the ordinary pressure of the atmosphere, however, the engine was found to require to be of large dimensions as compared to a steam-engine of the same power; and in order to obviate this objection, compressed air was used, the idea originating with Mr. James Stirling, C.E. Several other difficulties were successfully surmounted by the Messrs. Stirling, and eventually two improved engines were constructed, one of which was tested to fully 40 horse-power. This latter engine did all the work of the Dundee Foundry Company regularly for upward of three years, during which period they employed no other motor. At the end of this period it

CALOTROPIS—CALOTYPE.

was laid aside, principally owing to the repeated failure of one of the heating vessels.

Capt. Ericsson, in his attempt to introduce his C. E. in the large ship which bore his name, and was tried in New York harbor, experienced precisely the same difficulties and disappointments, and tried nearly the same remedies as the Messrs. Stirling. Some have thought, however, that he actually believed his 'regenerator' was to make the *same heat* do work over and over again—to be a kind of perpetual motion; if so it is not to be wondered at that his machines entirely failed, and that in two years (1855) they were replaced by steam-engines. On a small scale, engines on a somewhat similar principle have worked satisfactorily.

Air engines have recently been constructed, in which the solar rays, concentrated by means of an arrangement of mirrors, are utilized as the source of heat. These have been called *solar engines*.

CALOTROPIS: see MUDAR.

CALOTTE, n. *kă-lôt'* [F.]: a skull-cap; a cap worn on the top of the head as an ecclesiastical ornament in France.

CALOTTISTES, *kă-lôt'tists* (*Le Régiment de la Calotte*): society of witty and satirical men, in the time of Louis XIV., headed by two officers in the king's body-guard, named Torsac and Aimon. Their name was taken from the word *calotte* (a 'small cap,' worn by monks over the tonsure), and their amusement consisted in sending to any public character who had exposed himself to ridicule, a 'patent,' authorizing him to wear the *calotte* as a covering for the weak part of his head. The armorial bearings of the *Régiment de la Calotte* consisted of various symbols of folly, with the motto, '*C'est régner que de savoir rire.*' When Torsac, its first 'generalissimo' died, the society—which occupied a position of satirical hostility to the French Academy—drew up a burlesque funeral oration, manufactured out of the pompously eulogistic phrases that the academicians were in the habit of using. As the society became audacious, and did not spare even royalty itself, it was dissolved by the minister Fleury. The *Mémoires pour servir à l'Histoire de la Calotte* (Basel, 1725) is an amusing little book. During the Restoration, the title *Régime de la Calotte*, was applied to the priestly administration of affairs.

CALOTYPE, n. *kăl'ô-tip* [Gr. *kalos*, beautiful; *tupos*, a type or stamp]: a photographic process. The C. process comprehends a variety of methods for the production of negative photographs on paper; and was so named by the inventor, the late Dr. H. Fox Talbot, who exhibited the result of his experiments in 1840. The *principle* involved in the C. P. depends on the susceptibility to the action of daylight of a surface chemically prepared, and the *practice* consists in the preparation, and exposure in the camera, of a sheet of paper, having on one surface an even and finely divided layer of iodide of silver, nitrate of silver,

and an organic acid; the image obtained on this surface being subsequently developed with gallionitrate of silver. One process—the best—for imparting a high degree of sensibility to the paper, is as follows:

Good paper, sized with gelatine, should be chosen, the starch-sized papers being unsuitable, on account of the solutions sinking in too deeply, and thus impairing that sharpness of outline which should be possessed by a good negative. The paper is then floated on one side, and for a moment only, on a solution of iodide of silver in iodide of potassium, prepared by adding freshly precipitated iodide of silver to a *strong* solution of iodide of potassium. It is then dried, and plunged into a dish containing distilled water, which, by removing the soluble iodide of potassium, precipitates the iodide of silver in an even and finely divided condition over the whole surface of the paper, which in this state will keep good for twelve months. It is now ready to receive the *sensitive coating*; this operation, termed *exciting* the paper, is performed in the following manner: Two solutions are prepared—one, a saturated solution of gallic acid in cold distilled water, termed solution A; the other, a solution of 50 grains of nitrate of silver in one ounce of distilled water, to which one drachm of glacial acetic acid has been added; this is termed solution B. The iodized paper obtained as above is now laid on a board having a piece of clean blotting-paper on it a little larger than the paper to be excited, and the following solution brushed over it with a clean Buckle's brush—distilled water, 1 oz.; solution A, 15 drops; solution B, 15 drops. This mixture, prepared in a chemically-clean glass vessel, should be freely applied, and the excess absorbed by clean blotting-paper. The paper is now ready for exposure in the camera, and may be at once placed in the dark slide; or a stock may be thus sensitized, and preserved between folds of blotting-paper until required for use. The *time of exposure*—varying from three minutes to a quarter of an hour—is determined by the diameter and focal length of the lens employed, the aperture of the diaphragm or stop, and the amount of light prevailing at the time. The *development of the latent image*, an operation which, like the preceding, is of course conducted in a room illuminated only by yellow light, is accomplished by applying freely and uniformly over the whole surface solution A; and when the image begins to appear, applying a second quantity, to which a few drops of solution B have been previously added, to increase the intensity. The whole operation of development occupies about a quarter of an hour; and when the details are fully out, the picture should be washed with water, and *fixed*, by immersion in a solution of 1 part of hyposulphite of soda to 4 parts of water; it is then again freely washed in frequent changes of water during several hours; it is lastly *dried* and *waxed*; when it may be regarded as a finished negative, from which positive prints may be obtained, having the lights and shadows as in nature. See POSITIVE PRINTING.

CALOYER, n. *kă-loy'ër* [mod. Gr. *kalögëros*, a monk—from Gr. *kălos*, good; *gërôn*, an old man]: general name for

CALPE—CALPURNIUS.

the monks of the Greek Church. The Caloyers follow the order of St. Basil, and are in three ranks: the novices, *Archari*; the ordinary professed, *Microchemi*; and the more perfect, *Megalochemi*. It is always from among them that bishops and patriarchs are chosen, because they are generally members of the most distinguished families of the upper and middle classes. The Caloyers also furnish the only learned theologians in Greece at the present day. Their monasteries are very numerous. The most celebrated in Asia is that of Mount Sinai, founded by the Emperor Justinian, and endowed with a revenue of 60,000 crowns. In Europe, Mount Athos alone has 20, the inmates of which have so great a reputation for sanctity that even the Turks seek an interest in their prayers. The Caloyers are obliged to labor for the benefit of their monastery as long as they continue in it. Their religious services occupy an unnaturally large portion of their time, beginning at midnight, and continuing at intervals until sunset. They observe four Lents: the first, of eight weeks, in commemoration of the resurrection of our Lord; the second, of three weeks, in honor of the holy apostles; the third, of fourteen days, in commemoration of the Assumption of the Virgin; and the fourth in commemoration of the Advent.—Their are also female Caloyers, or Greek nuns, who likewise follow the rule of St. Basil.

CALPE: see HERCULES, PILLARS OF.

CALPEE, *kāl'pē* (*Kālpi*): town in the dist. of Jalaun, in the N. W. Provinces of India, on the right bank of the Jumna, lat. $26^{\circ} 7' \text{ n.}$, long. $79^{\circ} 48' \text{ e.}$ It is an entrepôt for the cotton of the neighboring district. It has manufactures of cotton and paper, and is celebrated for the excellence of its refined sugar. It became British by capture and cession, respectively, 1803 and 1806. It is 51 m. s.w. of Cawnpore, and is closely linked with it in the history of the insurrection of 1857–58, as the headquarters of the Gwalior Contingent. Pop. 18,000.

CALPENTYN, *kāl-pên-tîn'*: long and narrow peninsula on the w. side of Ceylon, lat. $8^{\circ} 14' \text{ n.}$, long. $79^{\circ} 53' \text{ e.}$ The neck is so low as to be overflowed during the n.e. monsoon, so that it is transformed into an island.

CALPURNIUS, *kāl-pŭr'nŭ-ŭs*: name of a gens in ancient Rome (see GENS). The Calpurnia gens was, by its own account, one of the oldest plebeian clans in Rome, but it does not figure in history till the time of the first Punic war. The family names, in the time of the Republic, were Bestia, Bibulus, Flamma, and Piso.

MARCUS CALPURNIUS BIBULUS, d. B.C. 48, is known as the hostile but incapable colleague of Cæsar (q.v.) in the consulate. He was put up by the aristocratic party, who spent vast sums to carry the election. He finally joined the Pompeian party, had command of the fleet intended to prevent Cæsar's passage to Greece, and died before the battle of Dyrrhachium.

CALPURNIA, daughter of Calpurnius Piso (consul B.C. 58), and the last wife of Cæsar, seems from the scanty notices

CALTABELLOTA—CALUMBA.

which remain, to have been a quiet domestic woman, full of love and solicitude for her great husband.

CALPURNIA, daughter of L. Calpurnius Bestia, wife of P. Antistius, killed herself B.C. 82, when her husband was murdered by order of the younger Marius.

CALTABELLOTA, *kâl-tâ-bêl-lôt'tâ* [Saracenic, the Castle of the Cork-trees]: town of Sicily, Girgenti, 7 m. n.e. of Sciacca, most picturesquely situated around an ancient castle, which crowns a steep rock overhanging a stream (ancient *Crimisus*), of the same name as the town. Of its churches the *Chiesa Matrice* is a beautiful relic of the middle ages, resembling a mosque, with a single row of columns down the middle. C. was captured by the Saracens 840. Pop. 6,200.

CALTANISSETTA, *kâl-tâ-nê-sêt'tâ*: province of central Sicily, bounded n. by Palermo, e. by Catania, s. by the Mediterranean, w. by Girgenti; it has three districts. C. produces cattle, wine, olive oil, cotton, hemp, and almonds, besides marble, sulphur, and other minerals. There are iron works and manufactories of chemicals. Area, 1,455 sq. m. Pop. (1890) est., 304,444.

CALTANISSETTA: fortified town of Sicily, on a fertile plain near the Salso, about 28 m. n.e. of Girgenti. It has mineral springs and extensive sulphur-works. Pop. (1881) 25,027.

CALTAVUTURO, *kâl-tâ-vô-tô'ro*: town of Sicily, province of Palermo, 37 m. s.e. of the city of Palermo, on a small river, the Grande. The town is of Saracenic origin. Jasper is found near C. Pop. 5,600.

CAL'THA: see MARSH MARIGOLD.

CALTONICA, *kâl-tô-nê'kâ*: town of Sicily, about 15 m. n.w. of Girgenti. It has extensive sulphur-works and salt-works. Pop. 7,000.

CALTROP, or **CALTHROP**, n. *kâl'trôp* [AS. *coltræppe*, a species of thistle], in Military



Caltrop.

Affairs: a four-pronged piece of iron, each prong about four inches in length, to be placed in ditches or breaches, or strewn over plains to arrest besieging troops, or an enemy's cavalry. The C. is so shaped that one prong is sure to stand upright, and may work terrible mischief to the enemy's horses or men.—C. is the name also of a plant whose fruit is armed with spines,

species of *Tribulus*, ord. *Zyg'ophyllacæ*.

CALUIRE, *kâl-wêr'*: town of France, dept. of the Rhone, on the left bank of the Saone, about three m. n.n.e. of Lyon. It has three annual fairs. Pop. (1881) 8,774; (1890) 9,112.

CALUMBA, n. *kă-lùm'bă* [*kalumb*, the name given to it in Mosambique]: root of *Cocculus palmatus*, herbaceous plant

CALUMET.

of the nat. ord. *Menispermaceæ* (q.v.), extensively used in medicine. It is said to derive its name from Colombo in Ceylon, although the C. now chiefly in use is the product of Mosambique. The flowers in this genus have 12 sepals and petals in all, similar in appearance, and disposed in four rows. The male and female flowers are on separate plants. *C. palmatus* has nearly circular leaves with 5-7 lobes, on long, hairy foot-stalks, and solitary axillary racemes of small green flowers, the racemes of the male plants branching. The fruit is a drupe, or 1-seeded berrylike fruit, about the size of a hazel-nut, densely clothed with long hairs. The stem is annual and twining; the root perennial, consisting of clustered spindle-shaped fleshy tubers, with a brown warty epidermis, and internally deep yellow. The plant is not cultivated; the root is collected where it grows wild in dense forests. It is dug up in March, cut into slices, or short cylindrical pieces, and dried in the shade. In this state it appears in commerce, having a greenish-yellow tint, a very bitter taste, and a faint aromatic odor. Its bitterness is ascribed to a somewhat narcotic principle called Calumbin or Calumbine (bitter extract of C. root), and to *Berberine*, an alkaloid originally discovered in the Barberry (q.v.), which also is present in it. C. is regarded as one of the most useful stomachics and tonics. It is demulcent, not at all stimulant, and capable of being used in cases in which almost every other tonic would be rejected by the stomach. It is sometimes given to allay vomiting. It has been found very useful in diarrhea and dysentery. It is administered in the form of powder, infusion, or tincture. Similar properties seem to reside in the roots of the species of *Cocculus* generally.—The very poisonous seed known by the name of COCCULUS INDICUS (q.v.) belongs to a plant of a different though allied genus. The root of *Frasera Walteri* is sometimes fraudulently substituted for C. and has been called American Calumba Root. It does not agree with C. in its properties, but, besides its very different appearance, it may be distinguished by its undergoing no such change of color when touched with tincture of iodine as in true C. Root is occasioned, produced by the presence in it of starch: see FRASERA.

CALUMET, n. *kāl'û-mět* [F.—from mid. L. *calamel'lus*, and *calamet'us*, dim. of L. *calāmus*, a reed]: American reed plant whose stems were used as pipe-stalks. The 'peace-pipe' of the N. American Indians is a tobacco-pipe having a stem of reed about two ft. and a half long, decorated with locks of women's hair and feathers, and a large bowl of polished marble. It has an important place in the conclusion of treaties, of which it may be described as the ratifier. After



Calumet, or Pipe of Peace.

a treaty has been signed the Indians fill the C. with the best tobacco and present it to the representatives of the

CALUMET—CALVADOS.

party with whom they have been making treaty, themselves smoking out of it afterward. The presentation of it to strangers is a mark of hospitality, and to refuse it would be considered an act of hostility.

CALUMET: village in Calumet township, Houghton co., Mich., 12 m. from Hancock, 15 m. from Houghton, towns noted for their immense shipments of copper. C. is built on an inclined system of rocks known to geologists as the copper-bearing series, and to miners as the copper mineral range. It was founded by the corporation that owns the Calumet and Hecla mine, one of the richest copper mines in the world, for the accommodation of the operatives, and is (1888) a thriving place, provided by the corporation with excellent religious, educational, and benevolent institutions. It has a post-office, bank, several churches, and a school with 800 children and 22 teachers. Thirteen languages are spoken there. The rock beneath it varies from 10 to 15 ft. in thickness and extends to an unknown depth, the mainshaft of the mines having already reached a point nearly 2,500 ft. below the surface. The copper obtained there is pure metal, not ore that has to be smelted. In a single year (1902) these mines yielded the enormous amount of 39,982 tons of pure copper, about 1-13 the entire product of the globe; and since they were first operated more than 150,000 tons, valued above \$90,000,000 have been taken at comparatively little cost from them. Pop. (1884) tp. 8,725; vill. (1890) 1,159; (1901) 25,991.

CALUMNIATE, v. *kǎ-lŭm'nǎ-āt* [L. *calum'nĭātus*, attacked with false accusations—from *calumnĭā*, a malicious slander: F. *calomnie*]: to accuse falsely and maliciously; to slander; to spread evil reports of any one maliciously. **CALUM'NIATING**, imp. **CALUM'NIATED**, pp. **CALUM'NIATOR**, n. *-tēr*, one who calumniates; a false accuser. **CALUM NIA'TION**, n. *-ā'shŭn*, false and slanderous representations. **CALUM'NIOUS**, a. *-nĭ-ŭs*, slanderous; injurious to character. **CALUM'NIOUSLY**, ad. *-lĭ*. **CALUM'NIA'TORY**, a. *-tēr-ĭ*, slanderous. **CALUMNY**, n. *kǎl'ŭm-nĭ*, slander; false accusation; the making and spreading of reports injurious to character: for the law as to calumny (see **LIBEL**).—**SYN.** of 'calumniate': to asperse; slander; defame; vilify; villipend; lampoon; libel; traduce; backbite; bespatter; blacken; belie; —of 'calumny': aspersion; detraction; defamation; reviling, etc.

CALUSO, *ká-lŏ'so*: town of n. Italy, in Piedmont, province of Turin, about 11 m. s. of Ivrea, and connected with Turin by railway. Pop. 3,500.

CALVADOS, *kál-vá-dos'*: maritime dept. in the n.w. of France; bounded n. by the English Channel, and e., w., and s. by the dept. of Eure, Manche, and Orne; 2,130 sq. m. It is formed out of a part of the old province of Normandy, and is divided into six arrondissements. Its cap is Caen. The principal rivers are the Touques, Orne, Dives, Seulle, Dromme, and Vire. The coast, which has few bays or inlets, is partly bold ridges, and partly sand-downs, cliffs, and reefs. The reef between the mouths of

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the Orne and the Vire, called Calvados, after one of the vessels in the Spanish Armada wrecked on it, and from which the dept. takes its name, is very dangerous to navigation. The soil of the dept. is generally fertile, especially in the valleys, supplying rich pasturage for horned cattle, sheep, horses, and swine, the principal wealth of C. The climate is healthful, though changeable. Iron, marble, slate, and coal are found. There are various manufactures, and the coast-fisheries are of some importance. Pop. (1881) 437,771; (1891) 428,945; (1901) 410,178.

CALVAERT, *kál-várt'* or *kál-vár'*, DIONYIS (called also DIONISIO FLAMMINGO): 1555–1619; b. Antwerp: distinguished painter, especially in landscape. He settled early in Bologna, where he opened a school, and had among his students the celebrated Domenichino, Guido, and Albani, who were afterward, however, pupils of the Caracci. Many excellent pictures by him are preserved at Bologna.

CALVARY, n. *kǎl'vǎ-rĭ* [L. *calvāriǎ*, the skull of a man or beast, a smooth rounded rock like a skull—from *calva*, the scalp without the hair: F. *calvaire*, Calvary]: the place where Christ was crucified. All that is known of the locality is that it was outside, though near, the wall of Jerusalem, and in sight from a public road. None of the localities assigned by tradition can be identified as the actual scene of the crucifixion. They all are *within* the walls of the present city; but Hadrian made such great changes in the former limits and structures, that some of these places may have been outside the ancient wall. The expression 'Mount Calvary,' common throughout Christendom for a thousand years, is not met with in any ancient writer till 300 years after the death of Christ. Though it is not known that C. was a mount, this may be conjectured from its name, which may refer to a slight elevation of ground, or to a rock, rounded at top like a skull.

CALVARY, in Roman Catholic countries: a representation of the various scenes of the passion and crucifixion of our Lord, either in a small chapel, or external to the church, as at St. Jacques at Antwerp. It consists of three crosses with the figures of Christ and the thieves, usually as large as life, surrounded by a number of figures, representing the various personages who took part in the crucifixion. At Aix-la-Chapelle, the C. is a church on the top of a hill, surrounded by twelve sculptured stones, each marking an event which took place on the journey of the Savior to Mount Calvary. The approach to the C. is called the *Via Doloroso*, each of the stones marking what is called a station, at which the worshippers say a prayer in passing.—A stone crucifix by the roadside, usually in a grotto or recess, is also called a C.—In heraldry, C. is a cross upon steps, on a shield.

CALVE, v. *káv*: see under **CALF**.

CALVELLO, *kál-vě'l'łō*: town in the province of Basilicata, Italy, on a hill-slope about 13 m. s. of Potenza. It has two convents. Pop. 5,650.

CALVENTURA ISLANDS—CALVILLE.

CALVENTURA ISLANDS, *kál-vě̃n-tó'rá*: off the coast of Arracan, in the Bay of Bengal, their centre being in lat. 16° 53' n., and long. 94° 20' e. The group consists of two divisions—one to the s.e., composed of two lofty and well-wooded islets; the other to the n.w., seven bare rocks, chiefly of fantastic shapes.

CALVERED, a. *kál'verd* [Scot. *caller*, fresh]: in *OE.* and *Scot.*, applied to salmon dressed and cooked as soon as caught; crimped.

CALVERT, *kál'vert*, LEONARD: 1606–47, June 9: first gov. of Md. Its proprietor, C.'s elder brother, the second Lord Baltimore, sent C. to superintend the colony. With two vessels and 200 persons he sailed from Cowes, 1633, Nov. 22, landed at Point Comfort, Va., 1634, Feb. 24, sailed up the Chesapeake to St. Clement's Island, and founded St. Mary's, Mar. 27. A previous settler, W. Clayborne, of Kent Island, refused to acknowledge C.'s authority and was dispossessed, but returned and gave trouble, 1644,5. The Rom. Cath. religion was established by act of assembly, 1639, but large toleration was granted to all forms of faith, and persecution explicitly forbidden about 10 years later, so that Md. became an asylum for those whom Puritan severity excluded from New England.

CALVI, *kál've*: seaport on the island of Corsica, on a peninsula in the Gulf of Calvi, about 38 m. w.s.w. of Bastia; lat. 42° 35' n., long. 8° 43' e. It is strongly fortified, and has a good port, with a high light at its entrance, and considerable export trade. C. was captured by the English, 1794, after a siege of 51 days. Pop. about 2,000.

CALVILLE, *kál'vīl*: kind of apple, of which there are numerous sub-varieties. The calvilles diminish in thickness from the middle toward the calyx, where they form a point; they have regular ribs, and a large open seed-chamber; also a pleasant smell, and are unctuous to the touch. They are never altogether streaked; they have a fine loose flesh, with a flavor somewhat like that of the raspberry or strawberry. The White Winter C. is in high repute both as a culinary and dessert apple; it is extensively cultivated on the continent of Europe.

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CALVIN, *kāl'vīn*, **JOHN**: theologian and reformer: 1509, July 10—1564, May 27; b. Noyon, in Picardy, France. His father, Gerard Cauvin or Calvin, was procureur-fiscal of the dist. of Noyon, and sec. of the diocese. John was one of six children—four sons and two daughters. All the three sons who survived were bred ecclesiastics; and the reformer himself, while still only 12 years of age, was appointed to a chaplaincy in the cathedral church of Noyon. This he held as a means of support during the period of his education, and even for some short time after he had entered on his reforming career. C. was educated in circumstances of ease, and even affluence. The noble family of Mommor, in the neighborhood, invited him to share in the studies of their children; he was in some measure adopted by them; and when the family went to Paris, in his 14th year, he accompanied them, and participated in the benefits of the higher instruction there attainable. He was entered as a pupil in the Collège de la Marche, under the regency of Mathurin Cordier, better remembered, perhaps, by his Latin name of Corderius. It was under this distinguished master that C. laid the foundation of his own wonderful mastery of the Latin language. During this early period, he was distinguished by the great activity of his mental powers, and the grave severity of his manners. His companions, it is said, surnamed him the 'Accusative.'

For awhile his attention was directed to the study of law. His remarkable talents seemed to promise great success in this branch of study, and his father sent him, with the view of prosecuting it, to the Univ. of Orleans, then adorned by Pierre de l'Étoile, one of the most famous jurists of his day, afterward pres. of the parliament of Paris. At Orleans he continued the same life of rigorous temperance and earnest studiousness for which he was already noted. Beza says, that, after supping moderately, he would spend half the night in study, and devote the morning to meditation on what he had acquired. His habits of inordinate study seem to have laid thus early the foundation of the illness of his later years. It was while a law-student in Orleans that he became acquainted with the Scriptures, and received his first impulse to the theological studies which have made his name so distinguished. A relative of his own, Pierre Robert Olivetan, was there engaged in a translation of the Scriptures; and this had

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the effect of drawing C.'s attention, and awakening within him the religious instinct soon to become the master-principle of his life. It is not known that as yet his traditional opinions were unfixed, or that he had embraced with any decision the Protestant opinions that were spreading everywhere; but the seeds of the new faith were now beyond doubt sown in his heart, and from this time, though he still continued for a while his legal studies, his main interests appear to have been religious and theological. From Orleans he went to Bourges, where he acquired the knowledge of Greek, under the tuition of a learned German, Meichior Wolmar, to the influence of whose spiritual instructions also he was greatly indebted. He began here to preach the reformed doctrines, and passed over into the ranks of Protestantism, under the slow but sure growth of his new convictions, rather than under the agitation of any violent feeling. Here, as everywhere, his life presents a marked contrast to that of Luther.

He went, 1533, to Paris, then a centre of the 'new learning,' under the teaching of Lefevre and Farel, and the influence of the queen of Navarre, sister of Francis I. The Sorbonne itself had not escaped the infection. There was a growing religious excitement in the university, in the court, and even among the bishops. This, however, was not to last. The king was soon stirred up to take active measures to quell this rising spirit; and the result was that C. and others were obliged to flee for their lives. The story is that C. narrowly escaped, having descended from his window by means of his sheets, and fled, under the guise of a vine-dresser, a friend of his, in whose clothes he concealed himself. After this he returned for a short time to his native place, resigned the preferment which he held in the Rom. Cath. church, and for a year or two led a wandering life, sheltered in various places. He was at Saintonge; at Nerac, residence of the queen of Navarre; at Angoulême, with his friend Louis Tillet; then for a brief while at Paris again, in the strange expectation of a meeting with Servetus, who had expressed a desire to confer with him. Persecution against the Protestants at this time raged so hotly, that C. was no longer safe in France; and he betook himself to Basel, where he is supposed to have prepared the first edition of the *Institutes of the Christian Religion*, and whence he certainly issued, 1535, the famous preface addressed to Francis I. The concentrated vigor of this address, its intensity of feeling, rising into indignant remonstrance, and at times a pathetic and powerful eloquence, make it one of the most memorable documents in connection with the Reformation. It is throughout a noble defense of the righteous character of the reformed doctrines, and their support alike in Scripture and in history. The energetic decisiveness and moral zeal of the future teacher and legislator of Geneva, speak in every page of it. After completing this great service to Protestantism, he made a short visit in Italy, to Renée, Duchess of Ferrara. Finally, he revisited his native town; sold the paternal estate, which had devolved to him on

the death of his eldest brother; and bidding it adieu, set out in company with his younger brother and sister on his way to Strasburg. The direct road being rendered dangerous by the armies of Charles V., which had penetrated into France, he sought a circuitous route through Savoy and Geneva.

The result of this journey was memorable for the cause of the Reformation. Arrived in Geneva, he met there his friend, Louis Tillet, who communicated the fact of his arrival to Farel, then in the very midst of his struggle to promote the Reformation in the city and neighborhood. Farel hastened to see him, and urge upon him the duty of remaining where he was, and undertaking his share of the work of God, under the burden of which he was like to fail. C. did not at first respond to the call. He was given, he himself says, to his 'own intense thoughts and private studies.' He wished to devote himself to the service of the reformed churches generally, rather than to the care of any particular church. A life of intellectual and theological labor was that which at that time was most congenial to him. By some strange insight, however, Farel penetrated to the higher fitness of the young stranger who stood before him, and he ventured, in the spirit of that daring enthusiasm which characterized him, to lay the curse of God upon him and his studies if he refused his aid to the church of Geneva in her time of need. This seemed to C. a divine menace. 'It was,' he said, 'as if God had seized me by his awful hand from heaven.' He abandoned his intention of pursuing his journey, and joined eagerly with Farel in the work of reformation.

Thus began C.'s great career in Geneva. Having entered upon his task, he soon infused an energy into it which crowned the struggling efforts of Farel with success. The hierarchical authority was already overturned before his arrival; the citizens had asserted their independence against the Duke of Savoy, whose alliance with the corrupt episcopate, which was the direct governing influence in the place, had called forth the patriotic as well as the religious feelings of the people. The magistrates and people eagerly joined with the reformers in the first heat of their freedom and zeal. A Protestant Confession of Faith was drawn out, approved of by the Council of Two Hundred, the largest governing board of the city, and then proclaimed in the cathedral church of St. Peter's as binding upon the whole body of the citizens. Great and marvellous changes were wrought in a short time upon the manners of the people; where license and frivolity had reigned, a strict moral severity began to characterize the whole aspect of society. The strain, however, was too sudden and too extreme. A spirit of rebellion to the rule of C. and Farel broke forth; the two reformers refused to yield to the wishes of a party animated by a more easy and liberal spirit than themselves, and known in the history of Geneva under the nickname of Libertines; and the consequence was, that they were both expelled from the city after less than two years' residence.

C. retreated to Strasburg, where he had meant to go when arrested in his course at Geneva. Here he settled, and devoted himself to theological study, and especially to his critical labors on the New Testament. Here, also, 1539, Oct., he married the widow of a converted Anabaptist. The marriage appears to have proved a happy one, although not of long duration.

The Genevans found, after a short time, that they could not well dispense with Calvin. His rule might be rigid; but an authority, even such as his, which might gall from its severity, was better than no settled authority at all; and the Libertine party seem to have been unable to construct any efficient and beneficent form of government. Accordingly, the citizens invited C. to return; and after some delay on his part, in order to test the spirit in which they were acting, he acceded to their invitation, and in the autumn of 1541, after three years' absence, once more made his entry into Geneva.

Now, at length, he succeeded in establishing his plan of church-government, in all its forms and details. By his College of Pastors and Doctors, and his Consistorial Court of Discipline, he founded a theocracy, with himself at the head of it, which aimed virtually to direct all the affairs of the city, and to control and modify both the social and individual life of the citizens. Not without a struggle, it may be supposed, did he succeed in his great autocratic scheme. The Libertines, though dishonored by their ineffectual attempts to maintain order in the city, and uphold its rights and dignity, still remained a strong party, which was even augmented, after C.'s return, by men such as Amy Perrin, who had strongly concurred in the invitation to C., but who were afterward alienated from him by the high and arbitrary hand with which he pursued his designs, as well as by their own schemes of ambition. The struggle with this party lasted with various fortune for no less than 15 years, and was only terminated in 1555, after a somewhat ridiculous *émeute* in the streets. Amy Perrin and others, driven from the city, were put to death in effigy; and there former's authority from this date confirmed into absolute supremacy.

During this long struggle with the Libertines, C. had many other disputes, in which he conducted himself with no less heartiness and zeal. The most remarkable of these were his controversies with Sebastian Castellio, Jerome Bolsec, and above all, Michael Servetus.

C. had become acquainted with Castellio at Strasburg. They entertained at first a warm friendship for each other, and C. showed great zeal in assisting Castellio, whose poverty and learning had attracted his sympathy. When he returned to Geneva, he invited Castellio to join him there, and procured for him the title of regent or tutor in the gymnasium of the city. There was little similarity, however, in the characters of the two men, and the diversity of their tastes and views soon became apparent. The learning of Castellio was intensely humanitic; a classical spirit and a somewhat arbitrary opinionativeness molded all his

studies; and as soon as he began to apply himself to the theology, he came into contact with Calvin. In a letter to Farel, 1542, C. speaks of the freaks of 'our friend Sebastian, which may both raise your bile and your laughter at the same time.' These freaks relate to Castellio's notions of Scriptural translation, and his refusal of C.'s offer to revise the version which he had made of certain parts of Scripture. Then, two years later, when Castellio desired to enter into the ministry, C. dissuaded the council from accepting him, on account of some peculiar opinions which he held. These were certain rationalistic views as to the authenticity and character of the Song of Solomon, the descent of Christ into hell, and also about election. After this, Castellio left Geneva for a while, but soon returning, he attacked the views of C. openly. After a violent scene in church, which is painted in C.'s letters very strongly, he was forced to leave the city. The two old friends, now declared enemies, did not spare each other henceforth. The fate of Servetus drew forth an anonymous publication, attacking with keen logic and covert and ingenious sarcasm the Genevan doctrines. This publication was attributed by both C. and Beza to Castellio, and they replied to him in no measured terms, stigmatizing him as a 'deceiver and vessel of Satan.' One fact really disgraceful to C. in the controversy deserves not to be passed over. Sunk in great poverty, Castellio was obliged, in his old age, to gather sticks on the banks of the Rhine at Basel, as a means of support. C. did not hesitate to accuse him of stealing the sticks—a dismal instance of polemical truculence which may well make us turn away in disgust and indignation.

The controversy with Bolsec belongs to a later period. Jerome Bolsec, originally a Carmelite monk, had thrown aside the habit, and betaken himself to the practice of medicine in Geneva. He was led to attack C.'s doctrine of predestination. As soon as C. heard of this he led him to understand that he was not at liberty to question the Genevan doctrine. He and the other clergy dealt with him; but after repeated disputations Bolsec was found incorrigible, and was sentenced to banishment from the city. Cast out of the theocratic community, he ultimately rejoined the Rom. Cath. Church, and revenged himself in a somewhat mean way against C. by writing his life in a spirit of detraction and slander.

Of all these contests, however, the most memorable is that with Servetus. A melancholy interest encircles the name of this great heretic, which the criminal tragedy of his death keeps always fresh and vivid in the minds of all who hate intolerance, and who love truth above dogmatism. The character of Servetus himself has little to do with this interest. He seems to have been more a vain, restless, and enthusiastic dreamer, than a calm and patient inquirer. In his very dreams, however, and the vague audacities of his speculation, there is a kind of simplicity and unconscious earnestness that wins sympathy. He had entered into various connections with C., even from the

time of his early residence in Paris; particularly, he had sent him various documents containing the views fully developed in his work subsequently published under the title of *Restitutio Christianismi*. C. never concealed his abhorrence of these views; and in a letter to Farel as early as 1546, he threatens that if Servetus should come to Geneva he would do what he could to bring him to condign punishment: *Nam si venerit, modo valeat mea autoritas, vivum exire nunquam patiar*. The history of his seizure and condemnation at Vienne by the Rom. Cath. authorities, and especially of C.'s share in the correspondence which led to his seizure, is very complicated and obscure. It has been maintained that C. was the instigator, through a creature of his own of the name of Trie, of the whole transaction; it is *certain* that he forwarded to the authorities, through Trie, private documents which Servetus had intrusted to him, with a view to the heretic's identification, and as materials for his condemnation. Servetus was sentenced to be burned, but effected his escape, and, after several months' wandering, he was found at Geneva. It was his intention to proceed to Italy, where he hoped his opinions might meet with some degree of toleration, and he arrived at Geneva on his way. This is the explanation of an event otherwise unaccountable. Having ventured to church, according to the common account, he was recognized, apprehended, and conveyed to prison by C.'s order, just as he was about to leave the city. His trial, the particulars of which are full of interest, lasted, with various interruptions, for two months. He attacked C. with the most foul epithets, and C. retorted with a quite equal virulence and foulness. At length, 1553, Oct. 26, sentence was passed upon Servetus, condemning him to death by fire. C. used his influence to have the mode of death alleviated, but without success. On the very next morning the sentence was put into execution. On an extended eminence at some distance from the city, Servetus was fastened to a stake surrounded by heaps of oak-wood and leaves, with his condemned book and the MS. he had sent to C. attached to his girdle; and, amid his agonizing cries, the fire was kindled, and the wretched man expiated his heresy amid the flames. Whatever apologies may be urged for this memorable crime, it will remain a mournful and scandalous blot on the history of the Reformation. The disgrace of it has particularly attached to C., and with some justice, from the special and unhappy relation which he bore to the whole transaction, but most of the reformers are no less implicated in it. The wise Bullinger defended it, and even the gentle Melancthon could see cause only for gratitude in the hideous tragedy.

After the execution of Servetus, and the expulsion of the Libertines two years later, C.'s power in Geneva was firmly established, and he used it vigorously and beneficently for the defense of Protestantism throughout Europe. By the mediation of Beza, he made his influence felt in France in the great struggle between the hierarchical party, with the

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Guises at its head, and the Protestants, led by Condé and Coligny. In 1561, his energies began to fail. He had been long suffering from bad health, but his strength of will and buoyancy of intellect sustained him amid all his bodily weakness. In the year now mentioned, his illness greatly increased, and though he survived for more than two years, he never regained any vigor.

Very different estimates, it may be imagined, have been formed of C.'s character, according to the point of view from which it is contemplated. None, however, can dispute his intellectual greatness, or the powerful services which he rendered to Protestantism. Stern in spirit, unyielding in will, he is never selfish or petty in motives. Nowhere amiable, he is everywhere strong. Arbitrary and cruel when it suits him, he is yet heroic in his aims, and beneficent in the scope of his ambition. Earnest from the first, looking upon life as a serious reality, his moral purpose is always clear and definite—to live a life of duty, to shape circumstances to such divine ends as he apprehended, and, in whatever sphere he might be placed, to work out the glory of God.

He did for Protestantism a double work, which, apart from anything else, would have made his name illustrious: he *systematized its doctrine*, and he *organized its ecclesiastical discipline*. He was at once the great theologian of the Reformation, and the founder of a new church polity, Presbyterianism; and this two-fold work, at that period of transition, did more than all other external influences together to consolidate the scattered forces of the Reformation, and give them an enduring strength. As a religious teacher, as a social legislator, and as a writer, especially of the French language, then in process of formation, his fame is second to none in his age, and must always conspicuously adorn the history of civilization. Among C.'s most important works are: *Christianæ Religionis Institutio* (Basel, 1536); *De Necessitate Reformandæ Ecclesiæ* (1544); *Commentaires sur la Concordance ou Harmonie des Évangélistes* (Gen. 1561); *In Novum Testamentum Commentarii*; *In Libros Psalmorum Commentarii*; *In Librum Geneseos Commentarii*. The first edition of C.'s whole works is that of Amsterdam, 1671, 9 vols. fol. A complete critical edition by Baum, Cunitz, and Reuss began to appear at Brunswick, 1869. By the 'Calvin Translation Society,' in Edinburgh, his works have been collected, translated into English, and issued in 51 vols. 8vo. 1843-55. Besides the original *Vita* by Beza, there are lives of C. by Bolsec (from the Rom. Cath. standpoint, 1577; new ed. 1875), Audin (1840), Bungener, Viguet, and Tissot (1864); and in Germany, by Henry (1844), Stähelin (1863), and Kampschulte (vol. i. 1869).

CALVINISM, n. *kál'vín-izm*: the doctrines of *Calvin*, the Swiss Protestant reformer, of which predestination, particular election, and reprobation are leading features. CALVINIST, n. one who holds these. CALVINIS'TIC, a. *-is'tík*, or CALVINIS'TICAL, a. *-tí-kál*.

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CALVINISM, as a doctrinal system, distinguishes the churches more particularly called the Reformed, in distinction from the Lutheran and Anglican churches. Calvin's doctrinal views are laid down at length in his *Institutio Christianæ Religionis*, 1536. It was not till many years later, however, that the name of C. came to be attached to a certain set of doctrinal opinions, and not till the rise of Arminius (q.v.), and the synod of Dort (q.v.), 1618, that these opinions may be said to have been polemically marked off from others with which they are generally contrasted, and to which they are recognized as opposed.

The difference of thought expressed in the Arminian and Calvinistic systems is as old as the history of Christian doctrine. In almost every point, Augustine may be said to have anticipated Calvin; while Pelagius and the eastern divines, such as Chrysostom, represented a type of opinion upon the whole consonant to that which in more modern times has been opposed to Calvinism. In the Rom. Cath. Church, since the Reformation, the same opposition of thought has presented itself in the famous contest of Jansenism and Jesuitism.

The main point of distinction in the two systems or modes of Christian opinion, is as to the operation of divine grace in the salvation of sinners. In the one system, this operation is considered as predetermined and absolute; in the other, as merely prescient, and in some sense conditioned. *Predestination* and *Irresistible Grace* are the great key-notes of C.—its two main points. Others were added in opposition to Arminianism—viz., *Original Sin*, *Particular Redemption*, and the *Perseverance of the Saints*; but the first of these is not peculiarly Calvinistic, and the last two are merely corollaries from the doctrines of Predestination and Grace. Predestination is, in fact, the one distinguishing doctrine of the system, as it was of Augustinianism, of which C. was merely the revival. The divine will apprehended as decreative and predestinating, is necessarily *irresistible* in its efficacy, *select* in its objects, and *persevering* in its results. The characteristic of C., therefore, is that it is a speculative Christian system, springing from a single great principle, carried out rigorously into all its logical consequences.

The Church of England, in its earlier history, was Calvinistic in its creed, though mediæval and Roman Catholic in its ritual. Puritanism was a movement to reduce it in doctrine and practice, though not necessarily in polity, to a Calvinistic model. In the reaction which followed this movement, the Church of England, while retaining its original articles, nearly parted with its Calvinistic faith; and throughout the 18th c., its chief divines are conspicuously Arminian or latitudinarian. But with the revival of the evangelical party in the end of the century, C. revived; and it still maintains a noticeable influence over many minds in the Anglican establishment, while it is the professed creed of a great proportion of the dissenters.

The Church of Scotland, with the other Presbyterian

CALVINISTIC METHODISTS—CALW.

churches in Britain, and the large and increasing bodies of Presbyterians in America, all hold to the Westminster Confession of Faith, the most elaborate and formal expression of Calvinistic doctrine that exists. But while holding to the same Calvinistic standard, these churches show many varieties of actual opinion; and in the history of Presbyterianism, C. has shown a tendency in its logical development to pass into Rationalism or Unitarianism. This is conspicuously the case in the church of Geneva itself, in the Presb. churches in England previous to the last half-century, and in some of the old Puritan churches of America. There are signs that portions of those bodies that still assent to Calvinism, do not hold the standards with the ancient rigidity and thoroughness. Still, C. doubtless remains, as opposed to Arminian, Socinian, or any cognate forms of the same type of doctrine, the most living and powerful among the dogmatic systems of the Reformation.

CALVINISTIC METHODISTS: in England; Whitefield's connection, established 1741, and that of Lady Huntingdon, 1748. In Wales the movement had an earlier origin and a longer tenure. Howell Harris of Trevecca, Daniel Rowlands of Llangetha, and Howell Davies of Pembrokeshire began to itinerate 1735-6, independently of each other. Whitefield met Harris at Cardiff 1738, presided at a meeting of 10 clergy and 40 lay exhorters 1742, and at the first formal conference at Waterford, 1743, Jan. 5. After 1748 Whitefield ceased to act as their head, and the organization, always loose, gradually fell to pieces. Harris ceased to itinerate 1751, but the local societies were kept together by lay workers, and inspired by the hymns of Wm. Williams, 'the Watts of Wales.' Rowlands became a Dissenter 1763, and labored till 1790. At the latter date, T. Charles of Bala became a leader, and rules for the quarterly association were drawn up. An *Order and Form of Church Govt. and Rules of Discipline* were published 1801, and the preachers were ordained and made pastors, 1811. A thorough organization was not effected till 1864, when the first general assembly met. Its official *Psalms and Hymns* appeared 1870. There are two synods of North and South Wales; the constitution is a modified Presbyterianism. The body has two theol. colleges, at Bala and Trevecca, and carries on missions in Brittany and Bengal. In Gr. Britain (1889) its membership was 130,000. In the U. S. (1890) it had 12,722 communicants, 190 churches, church property \$625,875.

CALW, or **KALW**, *kálw*: important manufacturing town in Würtemberg: chief seat of the Würtemberg timber-trade with Holland, and cap. of the bailiwick of C., in the circle of the Black Forest; in the valley of the Nagold, on both sides of the stream, over which are two stone bridges. Cotton and woolen spinning, dyeing turkey-red, manufacturing woolen and cotton fabrics, making leather, stout shoes, cigars, etc., are the principal industries. Though the streets in the old town are irregularly built, there are

CALX—CALYMENE.

many large and beautiful houses. The inhabitants mostly are Protestants. Pop. (1871) 5,582 ; (1885) 4,632.

CALX, n. *kăłks*, plu. **CALXES**, *kăłk'sěz*, or **CALCES**, *kăł'sěz* [L. *calx* or *calcem*, limestone]: lime or chalk; the ashes or residuum left after burning a metal or mineral. As quicklime is produced by burning limestone, the alchemists applied the term C. to the product obtained by burning any ore or other mineral substance ; and *calcination* (q.v.) to the process.

CALYCANTHEMY, n. *kăł'ik-ănth'ě-mě*. [Gr. *kalux*, a flower-cup; *anthěmon*, a flower]: the conversion of sepals into petals either wholly or partially; the insertion of the corolla and stamens into the calyx. **CAL'YCANTH'EMOUS**, a. *-ě-měs*, having the sepals wholly or partially converted into petals; having the corolla and stamens inserted into the calyx.

CALYCANTHUS, *kăł-i-kăn'thūs* [Gr., calyx-flower]: genus of plants of the nat. ord. *Calycanthaceæ*, an order allied to *Rosaceæ*, and of which only a few species are known, natives of N. America and Japan—shrubs, with square stems of remarkable structure, having around the central woody axis four smaller imperfect ones. An aromatic fragrance characterizes this order. In the genus C., the bark and leaves possess it as well as the flowers. The bark of *C. floridus*, a native of Carolina, has been used as a spice and carminative, and has acquired the name of Carolina Allspice, or American Allspice. The flowers are of a chocolate color.

CALYCIFLORAL, a. *kăł-ís'í-flō'răl* [L. *calyx*, a flower-cup; *floralis*, floral]: in *bot.*, applied to those plants where the petals and stamens seem to be inserted on the expanded calyx tube, as in the rose.

CALYCOID, a. *kăł'í-koyd* [Gr. *kalux*, a flower-cup; *eidos*, resemblance]: calyx-like.

CALYDONIAN BOAR, *kăł-e-dō'ně-an bōr*: famed in Greek myth., according to which, a certain Ceneus, King of Calydon, ancient capital of Ætolia (on the river Evenus, abt. seven m. from the sea), omitted a sacrifice to Diana, whereupon the goddess, in her rage, sent into his fields a frightful boar, which committed great devastation. No one had the courage to hunt it except Meleager, the son of Ceneus, who, calling to his help the bravest heroes of Greece—Theseus, Jason, Nestor, and others—pursued and slew the monster. Later writers, however, affirm that he found it impossible to destroy the animal, until Atalanta, his mistress, aided him by piercing it with an arrow.

The city of Calydon appears in history as in the possession of the Achæans, B.C. 391. Until the time of Pompey it was of some importance. Augustus removed its inhabitants to Nicopolis, B.C. 31.

CALYMENE, n. *kăł'í-mě'ně* [Gr. *kalēmēnai*, to call by name]: genus of the fossil order Trilobites (q.v.). It differed from the other genera of the order in the individ-

CALYPSO—CALYPTRÆA.

uals having the power of rolling themselves into a ball, so that they are often found coiled up like an oniscus, i.e., hog-louse—*vulgo*, a slater. The genus is characteristic of the Silurian formation. The species *C. Blumenbachii*,



Calymene Blumenbachii.

has been long known as the 'Dudley Locust,' and is notable as a very long-subsisting species, passing from the Caradoc beds to the Ludlow rocks. Twenty species have been described.

CALYPSO, *ka-līp'so*, in Grecian Legend: according to Homer, the daughter of Atlas inhabited the solitary wooded isle of Ogygia, far apart from all gods and men. Ulysses being thrown upon her island by shipwreck, she treated him kindly, and promised him immortality if he would marry her. He was fascinated by her charms, but unwilling to desert his wife and his native land; she detained him, however, seven years, and bore him two sons. On his departure she died of grief.

CALYPSO BOREALIS, *ka-līp'sō bōr-ē-ā' līs*: plant of the order *Orchidaceæ*. It is a rare variety, found in marshy places in Canada and the northern United States. It has a single leaf, nearly heart-shaped; the flower is purple, pink, and yellow.

CALYPTOBLASTIC, a. *kă-līp'tō-blă's'tīk* [Gr. *kaluptos*, covered; *blastos*, a sprout or bud]: in *zool.*, designating the *Hydrozoa* in which the nutritive or generative buds possess an external receptacle.

CALYPTRA, n. *kă-līp'tră* [Gr. *kalyptra*, a covering for the head of a woman]: in *bot.*, a little hood covering the spore-cases of mosses. **CALYP'TRATE**, a. *-trăt*, having a calyptra.

CALYPTRÆA, *kă-līp-trē'a* [Gr. *kalyptra*, a head-dress]: genus of gasteropodous mollusks, of the order *Pectinibranchiata*, type of a family, *Calyptræidæ*, formerly included in the genus *Patella*, or Limpet, when the mere form of the shell was more regarded in classification than the structure of the animal, and still known as Chambered Limpets, Cup-and-Saucer Limpets, Bonnet Limpets, and Slipper Limpets. The shell is limpet-shaped, but the apex is more or less spiral, and has a calcareous process from its inner surface for the attachment of a principal muscle. The *Calyptræidæ* differ much in shape, some being very flat, others very conical; some elongated and slipper-like. The species are generally natives of the shores of

CALYPTRIMORPHOUS—CALYX.

warm climates. *Calyptroidæ* are common in the older fossiliferous rocks.

CALYPTRIMORPHOUS, a. *kă-lîp'trî-môr'fûs* [Gr. *kalup-tra*, a covering; *morphê*, shape, form]: in *bot.*, applied to ascidia or pitchers that have a distinct lid.

CALYX, n. *kă'lik's*, plu. **CALYXES**, *kă'lik-sêz*, or **CALYCES**, *kă'l'î-sêz* [L. *calyx*, a case or covering—from Gr. *kalux*, the cup of a flower]: in *bot.*, the outer envelope or whorl of the leaf-organs of a flower. **CALYCINE**, a. *kă'l'î-sîn*, or **CALYCINAL**, a. *kă-lîs'î-năl*, of or relating to a calyx; of the nature or appearance of a calyx. **CALYCLE**, n. *kă'l'î-kl*, or **CALYCU-ULUS**, n. *kă-lik'û-lûs*, a row of leaflets at the base of the calyx on the outside; an epicalyx. **CALYCLED**, a. *kă'l'î-klêd*, or **CALYCVLATE**, n. *kă-lik'û-lât*, having the appearance as if possessing a double calyx.

CALYX, *kă'lik's*, in Botany: outermost of the circles of modified leaves which surround the parts of fructification, and with them constitute the flower. Within the C. there is generally at least a second circle of leaves, called the corolla (see **COROLLA: FLOWER**); but this is sometimes lacking, and the C. is the only envelope of the parts of fructification. The leaves of which the C. is composed



Calyx of Thorn Apple, Pink, and Campanula.

are called sepals, when quite separate from each other; but they often grow together into a tube at the base, and the C. is then said to be *monosepalous* or *gamosepalous* [*monos*, one; *gamos*, union]. The sepals are generally simple and without stalks; they are generally green, and differ much less widely from ordinary leaves than the petals or leaves of the corolla; sometimes, however, they are *peta-loid*, and brightly colored, as in *Fuschia*. The C. and corolla of many endogenous plants resemble one another almost completely, and the common term *perianth* (q.v.) is then very generally employed. In some plants, the C. passes insensibly into the corolla, and it is not easy to distinguish the innermost sepals from the outermost petals. The C. is in such cases often composed of more circles of leaves than one. The C. occasionally falls off when flowering is over (*deciduous*), as in *Ranunculus*; sometimes even when flowering commences (*caducous*) as in the poppy; generally it remains till the fruit is ripe (*persistent*) and is then much enlarged and more brightly colored, as in *Physalis*. It often becomes fleshy and forms the seeming fruit, as in the rose.—The glumes (q.v.) of grasses, etc.,

CAM—CAMARILLA.

used to be regarded as a C., to which, however, they have no proper analogy.

CAM, n. *kām* [Dan. *kam*, a ridge, a comb: Ger. *kamm*, the cog of a wheel: comp. W. and Gael. *cam*, crooked, bent]: in *mech.*, a curved plate or groove, or a projecting part of a wheel or other moving piece, intended to produce, and regulate an alternate or variable motion: **ADJ.** in *OE.*, crooked.

CAM, n. *kām* [W. *cam*, crooked]: crooked river of England, which, rising in Essex, flows n.e. through Cambridgeshire, and after a course of about 40 miles, joins the Ouse $3\frac{1}{2}$ miles above Ely. It gives its name to the town of Cambridge, which stands upon it, and below which it is navigable. It is familiar as the race-course for the boats of Cambridge students. Its ancient name was **GRANTA**. —*Cam* is a prefix in many names of places denoting situation on or near the bend or crook of a river.

CAMAIEU, or **CAMAYEU**, n. *kă-mā'yū* [F.—from It. *cameo*]: a stone graven in relief; a painting in a single color, called also **MONOCHROME**. The ancients painted thus both in gray (*en grisaille*) and in red. Pictures of several tints, but where the natural colors of the objects are not copied, are said to be *en camaieu*. As one color generally prevails, we speak of blue, red, yellow, green *camaieu*. Polidori Caravaggio, for instance, so overlaid his other colors with brown, that his works give the impression of monochrome paintings. Drawings in Indian ink, red and black chalk, pencil, etc., as well as engravings, may be said to be *en camaieu*.

CAMALDOLITES, *ka-māl'dō-līts*: a religious order founded 1018 in the vale of Camaldoli, near Arezzo, in the Apennines, by St. Romuald, a Benedictine monk and a member of the family of the dukes of Ravenna. From Italy it spread into France, Germany, and Poland. The brethren, who wear a white garment, are, and have always been, characterized by the excessive rigidity of their monastic rule, showing to what lengths in a cruel mortification of natural life man can proceed. The order is now almost extinct.

CAMARGUE: see **BOUCHES DU RHONE**.

CAMARILLA, n. *kām'ă-rīl'ă* [Sp., a private room, especially one where boys are flogged]: in *Spain*, the confidants or irresponsible advisers of the sovereign. As *camara* (chamber) is used to designate, *par excellence*, the chamber of the king of Spain, the royal chamber, so C. was also used to designate his private chamber or cabinet, the place where he received his most intimate friends, courtiers, sycophants, and all the moral refuse that naturally gathers round a weak throne. Hence in the political language of modern Europe, it has come to signify the influence exercised on the state by secret and unaccredited councilors, in opposition to the opinions of the legitimate ministry, an influence which in Spain particularly has been found most pernicious. The

CAMBACERES—CAMBAY.

word first obtained this meaning in the time of Ferdinand VII.

CAMBACERES, *kǝng-bā-sa-rès'*, JEAN JACQUES RÉGIS, Duke of Parma, High Chancellor of the French Empire, under Napoleon: 1753, Oct. 18—1824, Mar. 5; b. Montpellier. In 1791, he was appointed pres. of the criminal court in his native place. Afterward, as member of the national convention, he was prominent in sketching the new code of laws, and distinguished himself by moderation. He denied the right of the convention to condemn the king, and, when this was done, argued in favor of a reprieve. After the revolution of the 9th Thermidor (1794, July 27), C. was elected pres. of the convention, and as head of the committee of public safety, was active in procuring peace with Prussia and Spain. His enemies having succeeded in expelling him from office, he engaged himself in legal studies, and laid before the Council of Five Hundred the sketch of a civil code which afterward formed the basis of the *Code Napoleon*. In 1796, C. was for a short time pres. of this council. After the changes made in the directory, he was made minister of justice, assisted in the revolution of the 18th Brumaire (1799, Nov. 9), was made second consul, and faithfully attached himself to the interest of Napoleon, by whom he was raised to the office of high chancellor of the empire, and in 1808, was made Duke of Parma. He in vain endeavored to dissuade Napoleon from the projected invasion of Russia. In 1813, when Napoleon took the field against the allies, C. was left as pres. of the regency, and in this capacity accompanied the empress to Blois, 1814. From this place he sent to Paris his vote for the abdication of Napoleon. During the Hundred Days, against his own will, he was made minister of justice, and pres. of the chamber of peers. After the second restoration, C. lived privately in Paris for some time; but in 1816, was exiled for having taken part in the execution of the decree for the death of Louis XVI. In 1818, his civil and political rights were restored, and he returned to Paris, where he lived in retirement till his death. Among the men of the Revolution C. was one of the few whose activity was peaceable and truly progressive. His services in the establishment of law were great. His nature was mild and candid, and his intellect very acute.

CAMBA'LUC: see PEKING.

CAMBAY, *kām-bā'*: feudatory or native Indian state in Hindustan; 350 sq. m.; of which the city of C. is the capital. It is within the political agency of Kaira, in the province of Guzerat, Bombay; and is governed by a nawab of its own who is a Mughal Mohammedan. Pop. (1891) 89,772.

CAMBAY: city of Hindustan, at the head of the Gulf of C., on the right bank of the Myhee; lat. 22° 18' n., long. 72° 39' e.; 76 m. n.n.w. of Surat. Formerly it was much more populous than now; ruinous palaces, mosques, and tombs, and an excavated temple of considerable pretensions, attest its past magnificence and extent. The main cause of its decay has been the gradual obstruction of its

CAMBAY--CAMBERWELL BEAUTY.

seaward navigation. It still exports grain, cotton, and ivory, besides its renowned manufactures in bloodstone and carnelian. Pop. abt. 33,700.

CAMBAY, GULF OF: large inlet, at the n.w. extremity of the peninsula of Hindustan, 80 m. in length, averaging 25 in breadth. In proportion to its size, it receives a vast quantity of fresh water—on the w. the Gooma, Oolowtee, Gelya, and Setroonjee; on the n. the Saburmuttee and Myhee; on the e. the Nerbudda and the Taptee. The inundations of so many rivers, and the ebb and flow of tides, which fall and rise 30 ft. combine to elevate the bottom, and to produce movable quicksands.

CAMBER, n. *kām'bēr* [F. *cambrer*, to bow, to crook—from L. *camērārē*, to arch over: Sp. *combar*, to bend: Gr. *kampto*, I bend]: a beam of wood slightly arched upon the upper surface; small dock in a dock-yard for containing boats, and for loading and unloading timber. **CAM'BERING**, a. bending—applied to the deck of a ship as slightly higher in the middle than at the ends. **CAM'BERED**, a. *-berd*, arched.

CAMBERT, *kōng-būr'*, **ROBERT**; 1628—abt. 1677; b. Paris: earliest composer of French operas. He studied under Chambounieres, was organist of the church of St. Honoré, Paris, and musical superintendent to Queen Anne of Austria, mother of Louis XIV. While his patron Cardinal Mazarin lived, C.'s works were performed before the court at Vincennes. Falling into neglect at home, he went to London, and was appointed bandmaster to Charles II. His opera *Pomone* was produced in London, but did not succeed. His principal works were *Ariadne* and *Les Peines et les Plaisirs de l'Amour*. He died in London.

CAMBERWELL, *kām'bēr-wēl*: formerly a rural village, now a suburb of London, on the s. side of the Thames.

CAMBERWELL BEAUTY (*Vanessa Antiopa*): one of the largest and most beautiful British butterflies, common in the central and s. parts of Europe. The wings are of a deep brown color, with a band of black around the brown, and an outer band or margin of pale yellow, the black band containing a row of large blue spots, the yellow margin dappled with black specks, all the colors rich and velvety. The margin of the wings exhibits tooth-like angularities. The antennæ are terminated by a knob. The caterpillar feeds on the willow. It is black, with white dots and a row of large red spots down the back, and is rough with soft spines:—When Camberwell,



Camberwell Beauty:

a, larva or caterpillar; b, pupa,
c, perfect insect.

CAMBIST—CAMBRAI.

now a London suburb, was more rural, and abounded in willows, this butterfly was sometimes taken there.

CAMBIST, n. *kām'bist* [F. *cambiste*; It. and Sp. *cambista*, a money-changer]: banker or money-changer; one skilled in the science of exchange. Cambist is also used figuratively as the title of a book in which the moneys, weights, measures, etc., of various nations are given in the equivalents of some particular one. **CAM'BISTRY**, n. *trī*, the science of exchanges, weights, etc. **CAM'BIAL**, a. *-bī-āl*, pertaining to.

CAMBIUM, n. *kām'bī-ŭm* [L. *cambio*, to change]: in bot., a layer of mucilaginous, viscid matter, particularly abundant in spring, interposed between the woody layers and the bark of trees and other stems. Delicate cells (*Cambrium cells*) are formed in it, which certainly fulfil important functions in the formation of new wood, though, notwithstanding much investigation by some of the greatest vegetable physiologists, the nature of these functions is still imperfectly known. The medullary rays are connected with the C. cells, and these cells gradually elongate into the shape which belongs to those of woody tissue. The C. layer is found only in exogenous stems.

CAMBODIA, *kām-bō'de-a*, or **CAMBOJA**, *kam-bō'ja* (native name *Kan-pou-chi*): extensive country of the Indo-Chinese Peninsula, now a protectorate of France, bounded on the s.w. by the Gulf of Siam, on the s.e. by French Cochin-China, and on the n. by Siam; about 39,000 sq. m. See **COCHIN-CHINA**. The surface is mostly flat, and the soil fertile. There are extensive forests, which shelter elephants and deer; there are also wild-cattle and ponies, and the rhinoceros abounds. Among the chief products are rice, betel, areca-nuts, gamboge, spices, sandal-wood, and ivory. Iron occurs. Pop. abt. 1,500,000.

CAMBON, *kōng-bōng'*, **JOSEPH**: 1756, June 17—1820, Feb. 15; b. Montpellier: French financier. As a member of the legislative assembly and of the national convention he urged the confiscation of the estates of émigrés and the execution of Louis XVI. In the committee of public safety he strove to save the Girondists, and promoted the fall of Robespierre, but was accused of complicity with that tyrant and obliged to fly. His report on finance, 1794, outlined the plan afterward adopted for the registration of the public debt. This service was not credited to him; he held no office under Napoleon, was exiled 1816, and died at Brussels.

CAMBON, **JULES MARTIN**: French diplomatist; b. 1845, Ap. 5; prefect of the Dept. du Nord 1882-87; of the Rhone 1887; became ambassador to U. S. in 1897; and rep. Spain in drawing up the Spanish-American protocol of peace 1898. In 1902 transferred as ambassador to Spain.

CAMBRAI, *kam-brā'*, Fr. *kōng-brā'*: city of France, dept. of the Nord, about 32 m. s.s.e. of Lille. It is on the right bank of the Scheldt, strongly fortified and well-built, with wide, but irregular streets, and many picturesque old

CAMBRIA—CAMBRIAN SYSTEM.

houses. The cathedral, archiepiscopal palace, town-house, and theatre are among the principal public buildings. The city was greatly injured in 1793, when the revolutionists, among other vandalisms, razed the fine cathedral. They also disintombed the remains of Fénelon, who was archbishop here, and melted his lead coffin into bullets. A monument, however, by David the sculptor was erected (1825) in the new cathedral, in memory of the immortal author of *Télémaque*. The manufactures are important, consisting of cambric—so called from its manufacture here—linen-thread, lace, cotton-yarn, beet-root sugar, soap, starch, leather, etc. It has also a trade in agricultural produce.

C. was known to the Romans under the name of *Cam aracum*, and was one of the chief cities of the Nervii. It was fortified by Charlemagne, and was long governed by its own bishops, to whom Charles the Bald ceded it. The celebrated league against the republic of Venice, which comprised the pope, the emperor of Germany, and the kings of France and Spain, was formed here 1508, and takes its name from the city. Here also were concluded treaties between the French king and the German emperor 1529, and in 1724-5 between Charles VI. and Philip V. of Spain. During 1815-18 it was the head-quarters of the British army of occupation. Pop. (1891) 24,122.

CAMBRIA, *kām'brī-a*: ancient name of Wales, the Britannia Secunda of the Romans; derived from that of Cimbri or Cymri, by which the Welsh have always called themselves. See BRETT'S AND SCOTS.

CAMBRIAN, a. *kām'brī-ăn* [*Cambria*, anc. name of Wales]: in *geol.*, a term used to designate the lowest fossiliferous rocks as developed in Wales, and their equivalents in other countries; pertaining to Wales: N. a native or inhabitant of Wales.

CAMBRIAN SYSTEM, *kām'brī-an*, in Geology: comprising the oldest known fossiliferous rocks, extensively developed in n. Wales (anc. Cambria). Their true limits have been the subject of considerable controversy. When Prof. Sedgewick first described them, they were considered inferior to the Silurian measures. Subsequent examination has shown that they are the equivalents of rocks previously described by Murchison as Lower Silurian; accordingly, geologists generally, following the classification of the government geological surveyors, confine the term to an extensive series of gritstones, sandstones, and slates, which underlie the Silurian Lingula beds. In Anglesea, these rocks have been metamorphosed in one place into chlorite and mica schists; in another, into gneiss, and all traces of organisms have been destroyed. In n. Wales they are less altered, but have as yet proved unfossiliferous. In the Longmynd (Salop), there is an apparent thickness of 26,000 ft. which may be, however, owing to folds in the beds. A few fossils have been noticed here, consisting of a fucoid plant or two, the tracks of annelids, and the fragments of a supposed trilobite, called *Palæopyge*

CAMBRIC—CAMBRIDGE.

Ramsayi. In Ireland, similar rocks occur, containing two species of a small branched zoophyte, named *Oldhamia*, and numerous tracks and burrows of sea-worms.

In the United States, palæozoic (period of ancient life) rock forms the surface of the greater portion of the country e. of the Rocky Mountains. Prof. Dawson treats the Cambrian as a division of the Silurian series, distinguishing it as the Siluro-Cambrian, or Lower Silurian, from the Silurian proper, or Upper Silurian; while Prof. Hunt describes it with more particularity in the order of Upper, Middle, and Lower Cambrian. The former authority, under the Lower classification and the latter under the Upper, agree in designating the Trenton group of limestones with the Utica slates and the shales and sandstones of the Hudson river group as the most pronounced representative of the system in the United States. The Lower and Middle of Prof. Hunt are seen in the Potsdam sandstone of N.Y., the Middle and Upper are found in the same state, and strata of the Lower extend from New Brunswick and Newfoundland into eastern Massachusetts. In Europe Cambrian beds grow thinner in a w. to e. progression, the series in England and Wales being more than 20,000 ft. thick and in Russia less than 1,000. In the United States the reduction in general is from e. to w. Dawson estimates the thickness in the e. part of America at quite as great in amount as in Europe, while in the region of the Mississippi the beds are scarcely thicker than in Russia; and Hunt, treating the entire palæozoic series, estimates its thickness in Penn. at 40,000 ft. and places the reduction in the valley of the Mississippi at 4,000. A special interest is attached to the study of the system in the United States, because of its great diffusion and the presence in the rock of unusually large limestones and a singular variety of marine fauna.

CAMBRIC, n. *kām'brīk* [from *Cambrai*, in Flanders]. general term for the finest and thinnest linen fabrics. Some of the finest cambrics, of the present day are produced in Switzerland. Scotch C. is really a muslin, being made of cotton with the fibre very tightly twisted, to imitate real or linen cambric: ADJ., pertaining to or made of.

CAMBRIDGE, *kām-brīj*: city in Massachusetts, at the s.e. extremity of Middlesex co., near the mouth of the Charles river, opposite to Boston, from the centre of which its central portion is about $3\frac{1}{2}$ m. n.w. Pop. (1880) 52,669; (1900) 91,886; fifth city in the state in this respect. C. is of an irregular oblong shape, with a length of 5 m., n.w. and s.e., and a breadth averaging less than 2 m. Along the n.e. side lies Somerville; on the n.w. and w. the towns of Arlington, Belmont, and Watertown; on the s.w. across the river, the Brighton district of Boston. C. is situated in the midst of a plain extending back from the Charles river, and has in general a level surface, the highest land being 77 ft. above sea-level. The soil is good and moist; it consists mostly of sand, gravel, and clay; in some sections there are extensive beds of clay, while in others

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clay underlies the sand and gravel. The underlying rock is supposed to be slate. The surrounding country is open, includes some large tracts of marsh, and has higher elevations than those of C. The immediate vicinity of the city is largely occupied by market gardens in which vegetables, etc., are raised for the Boston market. Fresh Pond, a picturesque lake of considerable size (175 acres), lies in the n.w. part of the city's area. The climate is virtually the same as that of Boston. The highest summer temperature in average years is $92^{\circ} \cdot 7$ F., the lowest winter temperature in average years, $5^{\circ} \cdot 7$. The prevailing winds are from the w. and n.w. The adjacent waters and marshes render the air moist. Miller's river, a tidal stream on the e., has had an unhealthful influence.

C. is connected with the Charlestown dist. of Boston, on the e., by a bridge; two bridges connect it with old Boston, one with Brookline, and three with the Brighton dist. of Boston. The Boston and Lowell railroad runs through the e. part of the city, the Boston and Fitchburg through the w. part. The Grand Junction railway, connecting the various roads running into Boston, also passes through the parts of the city nearest the river. An elevated railway from the centre of C. to Boston has been projected. At present the communication here is by horse-cars. There are more than 40 m. of horse-railroad track in C., with a great traffic, especially to Boston, with which the city is closely allied in many interests. The city comprises four sections—North C., Old C. or C. proper, East C., and Cambridgeport. The latter two are mainly manufacturing regions; the former are given mainly to residences, and are exceedingly attractive, with wide and beautiful streets shaded by old elms and other trees, and in many cases lined with mansions having tasteful lawns and gardens. The number of commons, parks, and public squares is 16, but their combined area is only 17 acres. The largest, Cambridge Common, in Old C., has an area of $8\frac{1}{2}$ acres, and contains a soldier's monument. The city has few public buildings of consequence. The city hall is situated in Cambridgeport, and contains the public library. The number of churches is about 30, Congl., Bapt., Episc., Meth., Rom. Cath., Unit., and Univ. The most beautiful church edifice is St. John's Memorial Chapel, belonging to the Prot. Epis. Theol. School; Christ Church, near the common, is the most venerable for associations. There are no theatres in the city, as these are supplied by the near metropolis; for similar reasons the newspapers are not of the first importance. In the central part of the city (Old C.) most interest attaches to the buildings of Harvard Univ. (q.v.), oldest, most famous, and in many respects most important, institution of superior education in the United States. In the w. part are situated C. cemetery, of 41 acres, and some 12 acres of Mt. Auburn cemetery, famous for its beauty; most of the area of the latter (125 acres) is in Watertown.

The assessed valuation of all taxable property (1902) was \$98,139,885; net pub. debt \$6,664,609; tax rate \$1.83

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per \$100 of assessed valuation for all purposes. The government is by mayor, aldermen, and common council. The total length of sewers was 110 m., built at a cost of \$1,428,200. The water-works are owned by the city, the water being derived from Fresh Pond. Gas is supplied by private enterprise. The system of public schools is elaborate and efficient. C. is one of the shire-towns of Middlesex co.; the courts are held and the county offices situated in East C. In 1900 the amount of capital invested in manufactures in C. was \$26,662,751, the leading industries were the making of organs and pianos, slaughtering and meat-packing, making of bricks and tiles, of soap and candles, printing and publishing, and the manufacture of furniture. But C. is less famed for its industries than for its university, which has long made Old C. a centre of cultivation and refinement.

C. was settled 1631, and was at first called 'the new town,' or New Town. The emigration to the Connecticut valley, 1636, took place thence. In its first years the town was extended over a very large area, even to the Merrimac river. The college was founded 1636; after the Rev. John Harvard's bequest to it, in 1638, the name of the town was changed to Cambridge, in memory of the univ. at which most of the educated men of the colony had studied. A printing press, the first in the English colonies, was established here 1639, and was actively employed. About 1650 a bridge over the Charles was built. In 1761, Christ Church, the first Episcopal church, was erected. C. was the centre of the American lines around Boston during the siege, and Washington took command of the continental army, 1775, July 3, under the 'Washington elm' on C. Common. After the surrender at Saratoga a large part of Burgoyne's army was quartered at C. An immediate result of the revolution was the removal of many royalist families. In 1793, the West Boston bridge, a marvel for those days, was opened to travel; this gave development to Cambridgeport, as the building of Craigie's bridge, 1807, did to East C. A large commercial activity was expected, but this was prevented by the embargo and the war of 1812. A city charter was granted 1846. C. furnished to the Union army and navy 4,588 men, about one-sixth of its population. The city purchased the water-works 1865.—L. R. Paige, *History of Cambridge*; S. A. Drake, *History of Middlesex County*; *King's Handbook of Cambridge*.

CAMBRIDGE: village in C. township, cap. of Guernsey co., O., on Will's creek, 59 m. n. of Marietta, 85 e. of Columbus. It is in a region rich in agricultural and mineral resources and with valuable coal veins, and has five churches, two monthly and three weekly newspapers, a national bank, and several mills. Pop. (1900) 8,241.

CAMBRIDGE, *kām'brīj*: chief town of the county of C., England; 48 m. n.n.e. of London. It takes its name from the river Cam, anciently called the Granta. By the Saxons, C. appears to have been known as GRANTABRYCGE,

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which is found with many slight variations of spelling, and probably became abbreviated into CANTBRIDGE. It is also supposed that C., and not the adjacent village of Grantchester, was the GRANTACEASTER of the Saxons. There are, however, traces of a camp at Grantchester. In 870 the Danes ravaged the country hereabouts, and are said to have destroyed the town. King John, in the second year of his reign (1200), granted a charter to the town, permitting it to have a guild of merchants, and in 1207, confirmed the burgesses in their privileges in perpetuity. In 1225, they paid a fine of 50 marks for having their liberties; and in 1227, Henry III. confirmed their charters. Since 1885 the town has sent one member to parliament instead of two. The university sends two members of its own. C. has 18 churches belonging to the church of England, besides chapels belonging to the Baptist, Congregationalist, and other bodies. The most curious church is that of the Holy Sepulchre, one of the few in England having a round tower. The town is not generally pretty or picturesque, but the gardens at the backs of the colleges, by the Cam, are extremely beautiful in the summer months. Its chief architectural features are the college and university buildings. Pop. (1871) municipal borough 30,078, parliamentary borough 30,996; (1891) municipal 35,363, parliamentary 40,878; (1901) municipal, 38,393.

CAMBRIDGE, ADOLPHUS FREDERICK, Duke of: 1774, Feb. 25—1850, July 8; seventh son of King George III. of England. He entered the army about 1790; and was appointed gov. of Hanover in 1816, and viceroy of the kingdom in 1831. His son, George William Frederick Charles, b. 1819, Mar. 26, became field marshal 1862 and subsequently and till 1895 commander-in-chief of the British army; then retired under the scheme of army reform.

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CAMBRIDGE, UNIVERSITY OF: one of the two ancient institutions of the kind existing in England. Overlooking several fabulous accounts of its origin, its true history may be said to begin at the opening of the 12th c. When Alfred of Beverley was student here, 1129, there were as yet no public halls or hostels, but each one lived in his own hired lodging.

The first regular society of students was that of Peterhouse, founded 1257. About this time students began to live together in hostels, under the rule of a principal, at their own charges. These hostels were named after the saints to whom they were dedicated, the churches which they adjoined, or the persons who formerly built or possessed them. In the year 1280 there were as many as 34, and some of them contained from 20 to 40 masters of arts, and a proportionate number of younger students; but all these hostels decayed by degrees when endowed colleges began to appear. Trinity hostel which survived all the rest, continued to 1540. The hostels were the beginning of what may be called the *college system*, which distinguishes the sister-universities of Oxford and Cambridge from those of Edinburgh, London, and the continent. See UNIVERSITIES.

It was between the latter part of the 13th and the close of the 16th c. that nearly all these royal and religious foundations were endowed which now constitute the university. Hugh de Balsham was the first benefactor in this way. Michael House was founded by Hervey de Stanton, 1324, and King's Hall by Edward III. 1332, both of which were merged in Trinity College by Henry VIII, 1546. Clare Hall, as it used to be called, one of the earliest, and still in its buildings one of the most attractive colleges in Cambridge, was founded by the Countess of Clare, 1326. Henry VI. has left himself an imperishable monument in the splendid foundation of King's College; and his queen, Margaret, commenced the foundation of Queens' College, which was added to by Elizabeth Widville, queen of Edward IV. Lady Margaret, Countess of Richmond and Derby, mother of Henry VII., founded Christ's College and St. John's at the beginning of the 16th c., and also the divinity professorship named after her. Henry VIII. appropriated part of the spoils of the monasteries to the foundation of Trinity College, and Queen Mary augmented the endowment. The five regius professorships were endowed by Henry VIII. Cambridge was frequently visited by the plague, and university proceedings were suspended by it in 1642 and 1666. In 1643, Cromwell took possession of the town, and the most eminent loyalists were expelled from the university. Almost all the colleges had sent their plate to the king at Nottingham. As might be expected, little was done for the university in this troubled century; indeed no new colleges were added until the founding of Downing College in 1800.

The predominance of the religious element in the college discipline is to be attributed as much to the circumstances and manners of the times in which the colleges were found-

ed, as to the piety of the founders. There had been, from very early times, 'religious houses,' and these were in many cases united with the new collegiate foundations. There were, for example, the Dominicans, or preaching friars, whose house is now turned into Emmanuel College. The friars who lived in these convents were capable of degrees, and kept their 'acts,' or exercises for degrees, as other university men. There were, however, frequent quarrels between them and the other students. To the same cause is to be traced the condition of celibacy, upon which, with few exceptions, the fellowships were formerly tenable. These conditions had been considerably relaxed before the abolition of the restrictions as to marriage and (except in the case of offices with clerical functions) holy orders, which was proposed by the statutes issued in 1881 by the Cambridge commissioners under the Universities of Oxford and Cambridge Act (1877). These statutes are to take the place of those confirmed by the queen in council 1858.

The governing body of the university is the senate; but, before being submitted to it all university laws must be approved by the council—a body elected by the resident members of senate. After the chancellor and high-steward, the chief executive power is vested in the vice-chancellor, who is elected annually from among the heads of colleges. The public orator is the voice of the senate upon public occasions. The proctors superintend the discipline and morals of all persons *in statu pupillari*; they are present at all congregations of the senate, read the 'graces,' and take the votes. The registry is responsible for the graces being offered in due form, and has charge of the university records. There are three terms in this university—the Michaelmas or October term, the Lent term, and the Easter term. To take an ordinary B.A. degree, a student must reside nine terms. The M.A. degree follows, without examination, about four years after. Dissenters are not now excluded from taking degrees, except in divinity.

With respect to the admission of students, their university course, expenses, and proceedings in degrees, the following information may be useful: There are four classes of students—viz., *Fellow Commoners* and *Noblemen, Pensioners, Sizars* and *Sub-sizars*, and the more distinguished students who are elected *Scholars* on the foundation of their college. The first class (now almost obsolete), are so called from their dining at the fellows' table; they wear silk or embroidered gowns, and pay heavier fees. The pensioners are the great body of the students, are not on the foundation, and pay for their own commons, viz., dinners in hall, etc., and for their rooms. The sizars are poorer students, selected, however, by examination, who receive free commons and certain money payments, are admitted at lower charges than the pensioners, but wear the same dress, and are no longer subject to the performance of menial offices as they formerly were. Some of the colleges, especially St. John's and Trinity, have very liber-

al endowments for the sizars, and considerable pecuniary assistance is given to the more deserving. The scholars are elected by examination, from the pensioners and sizars; they are on the foundation of the college, from which they receive certain emoluments. The fellows are subsequently elected from the scholars and the students who have distinguished themselves in the tripos examinations. Vacancies are, as a rule, filled up by members from the college, but fellowships are sometimes open to the competition of the whole university. The usual age of admission is 17-20 years. Before a student can be admitted, he must obtain from some master of arts of the university of Cambridge or Oxford a certificate of being qualified for admission; this certificate must be sent to the tutor of the college, with the caution-money, which, in the case of a pensioner, amounts to £15. At some colleges there is an entrance examination previous to matriculation, in place of the above certificate.

Residence is usually commenced in the October term. The undergraduate in his first year of residence is called a 'Freshman;' in his second year, a 'Junior Soph.;' in his third year, a 'Senior Soph.' The ordinary B.A., or bachelor of arts degree, may be taken in the ninth term of residence—viz., in the third June after coming up. The examinations required are: 1. The previous examination, or 'Little-go' (usually taken in the first or third term of residence), the subjects for which are a gospel in Greek, a Greek classic, a Latin classic, Greek and Latin grammar, Paley's *Evidences of Christianity*; Euclid i., ii., iii., vi.; arithmetic and elementary algebra. 2. The general examination in more advanced classics and mathematics. 3. A special examination in *one* of the following subjects: Theology, Logic, Political Economy, Law, Modern History, Chemistry, Botany, Zoology, Geology, Applied Science, Music. Candidates for honors have to pass certain additional mathematical subjects in their 'Little-go,' and then have no further examination till the tripos. Honors may be taken in any of the following triposes: Mathematics, Classics, Moral Sciences, Natural Sciences, Theology, Law, History, Semitic Languages, Indian Languages. The mathematical tripos has existed since 1747; the classical, since 1824; the others are more recent. Previous to 1850, candidates for classical honors must first have obtained a place in the mathematical tripos. It was arranged that the following regulations for the triposes should come into effect 1882: The mathematical tripos is divided into three parts. The first two parts take place in the June at the close of the third year, or ninth term of residence, and the successful candidates will be arranged in three classes called wranglers, senior optimes, and junior optimes, the members of each class being also placed in order of merit. Only the wranglers may proceed to the third part of the examination in the following January. The subjects for this third part are divided into four groups, excellence in any one of which entitles to the highest honors. According to their success in this exam-

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ination, the wranglers will be re arranged in three classes, the names in each class being, however, in alphabetical order. The classical tripos consists of two parts—the first in general classical scholarship, and taking place at the end either of the second or of the third year of residence; the other at the end either of the third or of the fourth year, and including, besides a further examination in pure classics obligatory on all candidates, a special knowledge of one or two, but not more than two, of the following subjects: ancient philosophy, history, archeology, philology. The successful candidates in each part will be arranged in three classes. In the first part, the examiners may indicate differences of merit within the classes by the use of brackets; in the second part, the names are to be given in alphabetical order. The natural and moral sciences triposes have also been divided into two parts, a general and a special. The mathematical and classical triposes are followed by examinations for the Smith's mathematical prizes and chancellor's classical medals, the result of which often differs from that of the triposes.

The university has 35 professors, increased to 40 by the statutes of 1881, in addition to readers, demonstrators, and assistants. Besides having the advantage of the instructions, and being under the discipline of the university, previous to 1869 all students, and since that time the great majority of their number, are in connection with one of the colleges, and subject to its regulations. The tutor of the college is understood to be *in loco parentis* to his pupils; the dean has the oversight of 'religion and morals;' and instruction is given by college lecturers.

The great prizes at the university are the *Fellowships*, of which there are about 400. Their value and conditions of tenure vary greatly at the different colleges; but, under the statutes of 1881, restrictions as to marriage and holy orders are done away with, the stipend (exclusive of certain allowances) limited in most colleges to £250 per annum, and the length of tenure to six years. The last regulation does not apply to fellows who at the same time occupy a university or college office. There are also stipends attached to the various college offices—those of dean, bursar, lecturer, etc. The office of tutor is one of great honor and emolument. There are various other university distinctions, both scholarships and prizes, for an account of which the *Cambridge Calendar* should be consulted.

The following is a list of the colleges in the order of their antiquity. A particular notice of each college will be found in its alphabetical place.

NAME.	Founded.	Undergraduates in 1902.
St. Peter's College, or Peter House.....	1257	53
Clare College.....	1326	183
Pembroke College.....	1347	244
Gonville and Caius College.....	1348	236
Trinity Hall.....	1350	166
Corpus Christi, or Benedict College.....	1351	39
King's College.....	1441	138

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NAME.	Founded.	Undergraduates in 1902.
Queen's College.....	1448	93
St. Catherine's College, or Hall.....	1473	61
Jesus College.....	1496	105
Christ's College.....	1505	170
St. John's College.....	1511	247
Magdalene College.....	1519	42
Trinity College.....	1546	664
Emanuel College.....	1584	162
Sidney Sussex College.....	1598	79
Downing College.....	1800	51
Magdalene College.....	1876	42
Selwyn College.....	1882	75

Total..... 3,044

About half of these undergraduates have rooms in college; the others reside in lodgings, but under the same rules as to college discipline. Besides all such, there were (1902) 70 students unconnected with any college, making in all 3,114 undergraduate members of the university. Non-collegiate students were first admitted to the university, 1869, and are under a special board presided over by a censor, who acts as their tutor; 77 of their number are resident at Cavendish College, founded 1876 for the advantage of younger students, but not incorporated into the university. Selwyn College, in memory of Bishop Selwyn, was opened in 1882.

Few of the colleges present an imposing façade to the streets—King's is, perhaps, the only one which may be said to do so—but the quiet and picturesque beauty of the courts in the interiors is very pleasing. Other public buildings are the senate-house, where examinations are held, degrees conferred, and all public business of the university conducted. The Fitzwilliam Museum is the finest of the modern additions to the university. Viscount Fitzwilliam bequeathed (1816) £100,000 South-sea annuities, the interest of which was to build and support a museum. He left also a very valuable collection of books, paintings, etc., as a nucleus for future contributions. G. Basevi was the architect. The university library is a fine mass of buildings of different periods, and is said to contain about 500,000 vols. The geological museum contains the original collection of Dr. Woodward, which, out of respect to the founder, has been kept in its original state, unmixed with recent and vastly more numerous and interesting acquisitions. The university is indebted for many of these geological treasures to the late Professor Sedgwick. The mineralogical room contains the valuable collections of the late Sir A. Hume, Charles Brooke, and Henry Warburton. The Pitt Press is a gothic structure built in honor of Mr. Pitt, who was educated at Cambridge. It contains the university printing-offices, which are very extensive. There is also a good anatomical museum.

There is a very good hospital, founded 1753 under the will of Dr. Addenbrooke. The observatory contains some very fine instruments, among which is a large equatorial telescope, presented by the Duke of Northumberland 1835. The income (including trust-funds) of the university is about £33,000, which, by the statutes proposed by the commis-

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sioners under the act of 1877, is to be largely added to by the colleges, whose aggregate income is about £300,000 per annum.

For the most recent information about the university studies, etc., the *Cambridge Calendar* for the current year should be consulted; see also the *Student's Guide to the University of Cambridge* (5th ed. 1880); for the history, biography, and antiquity, see Fuller's *History of Cambridge*; Dyer; Caius; Le Keux' *Memorials*; Cooper's *Annals* (1842); Cooper's *Athenæ Cantabrigienses*; *Graduati Cantabrigienses*; Cooper's *Memorials of Cambridge* (1860); Ackermann's *History of the University of Cambridge* (1815); Huber's *English Universities* (transl. F. W. Newman, 1843); H. Gunning's *Reminiscences of Cambridge from the Year 1780* (2 vols. 1854); C. Wordsworth's *Social Life at the English Universities in the Eighteenth Century* (1874), and *Scholæ Academicæ* (1877); J. Bass Mullinger's *The University of Cambridge till 1535* (1873). Girton (q.v.) and Newnham Colleges for ladies are at Cambridge.

CAMBRIDGE PLATFORM: summary statement of the Congregational system of church government, drawn up by a synod of the New England churches, Cambridge, Mass., 1648. In 1646, May, the general court or legislature of Massachusetts passed an order expressing a desire that the 'elders and messengers' of the churches of the colonies of Massachusetts Bay, Plymouth, Connecticut, and New Haven should meet in synod for this purpose at Cambridge in Sep. Meeting there, the synod appointed three members to draw up each a plan of a scriptural model of church government. After two adjournments the synod, 1648, Aug., reassembled and considered these plans, finally adopting in the main that prepared by the Rev. Richard Mather, of Dorchester. The platform has 17 chapters. The first four affirm that the word of God prescribes one immutable form of church government, and define the nature of the Catholic church in general, and of a particular visible church; the fifth assigns the source of church power, whether of the elders or of the brethren. The sixth and seventh chapters provide that the officers of each church shall be elders (including pastors, teachers, and ruling elders) and deacons. The pastor and teacher having divided charge of the duties ordinarily performed by ministers at present, the ruling elders were to join with them in such matters as admission of members, ordination of church officers, excommunications, the calling of church meetings, and general guiding of church business. These officers, it was provided by the eighth chapter, must be chosen by the individual church, which, however, might well advise with neighbor churches. The ninth chapter treats of ordination, to be performed by the elders of the church or, in default of any, by some of the brethren; the tenth discusses the respective powers of the presbytery (or officers of the church) and of the 'brotherhood.' The next five chapters refer to the maintenance of church officers, the admission of members, their transfer from one church to another, excommunications, and other censures; and the

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intercommunion of churches by way of admonition one to another, or otherwise. Synods, consisting of elders and other church-members, to decide controversies respecting doctrine, but not to interfere in church-government, were provided for in the sixteenth chapter; and the last defined the duty of civil magistrates in matters concerning the churches, with whose freedom they were not to interfere. In 1649, the general court commended the platform to the consideration of the churches of Massachusetts, who approved it, whereupon it was indorsed by the court in 1651, was accepted as a helpful summary and guide, and long remained the standard of Congregational polity in New England. It was of authority, however, in only a general way, and as subordinate to Holy Scripture. As time passed, bringing new social developments and increasing experience, some of its points were modified in the practice of the churches; and this platform though still revered in its general spirit, has long ceased to be a guide in details of Congl. church administration.—*H. M. Dexter, Congregationalism as seen in its Literature* (1880).

CAMBRIDGESHIRE, *kām'brĭj-shēr*: inland county of England; lat. $52^{\circ} 1'$ — $52^{\circ} 45'$ n. long. $0^{\circ} 31'$ e., and $0^{\circ} 16'$ w.: greatest length about 50 m., breadth 30 m.; 820 sq. m. About three-fourths of the country consists of arable land, meadow, and pasture, the rest being fens. The surface of C., except in the s., which is somewhat elevated and on the chalk formations, is marshy and flat, thinly wooded, and with villages and churches here and there on slight elevations, called 'eys' or islands. The upper greensand, which in some places near Cambridge comes to the surface yields in rich abundance the curious fossils miscalled Coprolites (q.v.), of great value as an artificial manure. Their value is in some places equal to that of the land itself. The n. part of C. forms part of the Bedford Level. The chief rivers are the Ouse, which crosses the middle of the county from w. to e., with its tributary, the Cam; the Nene, which borders the county on the n.; and the Lark. These all are navigable to some extent. C. is an agricultural county. In the higher parts, the land produces fine crops of beans and wheat. Many cattle and sheep are now supported on the thin chalky soils. The black spongy soil of the fens consists of mud mixed with decayed vegetable matter, and when drained and burned, produces, in dry years, heavy crops of cole-seed, wheat, oats, barley, hay, potatoes, hemp, and flax. Horses, cattle, sheep, and pigeons are reared in the fens. The Isle of Ely, part of the fen-tract, and within the Bedford Level, is famed for garden vegetables; and the meadows of the Cam yield fine butter and cream-cheese. The chief towns of C. are Cambridge, the county town; Ely, Wisbeach, March, Thorney, Linton, Soham, Newmarket, and Royston. The manufactures of C. are mostly such as belong to an agricultural county. There are paper and parchment mills; and coarse earthenware is manufactured. Needle-making is also carried on to some extent. C. returns 3 members to parliament. This county was anciently the seat of a powerful tribe—the Icenī. It was

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crossed by several British and Roman roads, in some parts now covered by several ft. of peat-soil. Remains of Roman camps, sea-embankments, and villas, occur, and Roman antiquities, as coins and urns, have been found. There are some ancient—supposed pre-Roman—ditches miles in length. One of these, the Devil's Ditch, with an elevated vallum, having a slope of 52 ft. on one side and 26 ft. on the other, is about 100 ft. broad. In the 9th and 10th c., C. was the scene of severe contests between the Danes and Saxons. The Isle of Ely and its monks withstood William the Conqueror for 8 years. C., and especially the Isle of Ely, suffered much in the civil wars of Stephen, John, Henry III., and Charles I. There formerly were 36 religious houses in Cambridgeshire. Since Charles I.'s time, much fen-land has been reclaimed by embanking rivers and cutting new channels. Pop. (1871) 186,906; (1881) 185,594; (1891) 188,862; (1901) 185,128.

CAMBRONNE, *kǒng-bron'*, PIERRE JACQUES ÉTIENNE, Count: 1770–1842, Jan. 8.; b. St. Sébastien, near Nantes: French general. He served in the Vendean campaign under Hoche, in Ireland, under Masséna in Switzerland, and in all the campaigns of the empire. In 1806, he was made col. at Jena, distinguished himself in the retreat after the battle of Leipzig, and in 1814 accompanied Napoleon to Elba. In 1815 he was made lieut. gen. and peer of France, and at Waterloo commanded a division of the Old Guard; the famous reply, *La garde meurt et ne se rend pas*, attributed to him, is an invention. Captured at Waterloo, on returning to Paris he was imprisoned by Louis XVIII., but soon released. Made marshal 1820, he retired 1824, returned to the army at the time of the revolution of 1830, but soon retired again, and died at Nantes.

CAMBUSLANG, *kǎm'būs-lang*: parish and mining village in Lanarkshire, celebrated in the revivals of 1741: see WHITEFIELD.

CAMBYSES, *kǎm-bī'sēz*: King of the Medes and Persians: son of Cyrus and Cassandane; succeeded his father in the monarchy, B.C. 529, d. B.C. 521. C. is the Greek form of his name, the ancient Persian name is Kabujiya. In B.C. 525, C. invaded Egypt, defeated Psammenitus, King of Egypt, at Pelusium, and in six months made himself master of the whole country. He meditated further conquests, but was not permitted to carry his designs into effect; the Tyrians, upon whom his maritime power depended, refused to serve him against the Carthaginians; an army which he sent to take possession of the temple of Jupiter Ammon perished in the desert; and one which he led in person against the Ethiopians was compelled to return from want of provisions. C. now addicted himself to excessive intoxication, and perpetrated horrid cruelties in Egypt; the accounts of which, however, depending upon his enemies, the Egyptian priests, are doubtless exaggerated. It is probable, however, that his tendency to epileptic fits, with the arbitrary disposition induced by success and power, caused him to indulge in violent and capricious acts of tyranny.

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The Egyptians believed him to be mad. A pretender to the Persian throne having appeared, C. marched against him, but died on the way in Syria.

CAMDEN, *kām'den*: village and township of Knox co., Me., on w. side of Penobscot bay, 8 m. n.n.e. of Rockland. It has a good harbor, ship-yards, lime-kilns, a car factory, and a weekly paper. Pop. (1900) 2,825.

CAMDEN: city and port of delivery; cap. of Camden co., N. J.; on the Delaware directly opposite Philadelphia, with which it is connected by five ferries, and of which it is now the most populous suburb. De Vries landed on its site 1633, Jan. 10. It was chartered as a city 1831; at that time it was composed of three separate villages, and engaged in raising vegetables and fruit for the Philadelphia market. The Camden and Amboy railroad connecting with New York, added to its importance; it became afterward the terminus of others leading to Cape May and Atlantic City. It is regularly laid out, with streets at right angles, and contains 40 churches, and many good buildings. It has extensive iron-works at Kaighn's Point, several ship-yards, and many manufactories. There are eight wards, governed by a mayor and common council. The increase in pop. is rapid. Pop. (1900) 75,935.

CAMDEN, BATTLES OF: at Camden, S. C., 1780, Aug. 16, the American forces under Gen. Gates, 3,600 strong, chiefly militia, were totally defeated by Lord Cornwallis. This ended Gates's military career; he was removed from command and suspended from service pending an inquiry into his conduct. In this action Baron De Kalb, commanding the right wing, was mortally wounded. Congress erected a marble monument in his honor, on the street which bears his name; Lafayette laid the corner-stone 1825. In 1781, April 25, Greene, who had succeeded Gates, was attacked and worsted by Lord Rawdon at Hobkirk's Hill, near Camden; 100 or more were killed on each side; the Americans lost 100 prisoners. In 1865, Feb. 24, Camden was taken by Gen. Sherman, after a lively skirmish. Two thousand bales of cotton and a quantity of tobacco were burned.

CAMDEN, CHARLES PRATT, Earl of: 1714-1794, Apr.; younger son of Sir John Pratt, chief justice of the court of king's bench in the reign of George I. Educated at Eton and Cambridge, he studied for the law, and was called to the bar 1738. Not until 1752, however, when he defended a bookseller successfully against a government prosecution for libel on the house of commons, did C.'s prospects appear bright; from this time his success was certain. In 1757, he was appointed attorney-gen., and four years afterward accepted a seat on the bench in the court of common pleas. Judge in the trial of Wilkes, he declared his opinion emphatically that the action of government in this case, by general warrants, was altogether illegal—an opinion which, chiming in with public sentiment at the time made him the most popular of judges. In 1765, he was created Baron C. of Camden Place, Kent, by the Rockingham administration. to whose American

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policy, and to their treatment of Wilkes, notwithstanding, he offered constant opposition. The following year, when he was made lord chancellor, he did not abandon his principles; and four years afterward—the Duke of Grafton being then prime minister—he supported an amendment made by Chatham on the government address, and resigned his place. His judicial career ended here; henceforth, he was entirely a political character, and for more than 20 years was active against the ill-advised American policy pursued by Lord North, and in discussions on the law of libel, in which he maintained the popular view. As a judge, he is held in high estimation, though his manner was somewhat undignified. He filled the office of pres. of the council in the Rockingham administration 1782; also under Pitt from 1783 till his death.

CAMDEN, WILLIAM: scholar, historian, and antiquary: 1551, May—1623; b. London, where his father was a paper-stainer. His education commenced at Christ's Hospital, was completed at St. Paul's School, and at Oxford. In 1575, he was appointed second master of Westminster School; and while in this office he undertook the work which made his name famous, his *Britannia*, an account of the British Isles from the earliest ages, in elegant Latin, published 1586. It at once brought him into communication with the learned men of his time. Before 1607, the work had passed through six editions, being greatly enlarged and improved by the indefatigable industry of the author. The book, at first a comparatively small single volume, has received much additional matter from other writers. The best-known edition of C.'s *Britannia* is that of Edmund Gibson, in English, 2 vols. fol. Of this great work of C., Bishop Nicolson said it was 'the common sun whereat our modern writers have all lighted their little torches.' In 1593, C. was appointed head master of Westminster School; and four years later, he was made Clarendieux king-at-arms, an appointment which gave him more time for the pursuit of his favorite studies. His other most important works are—*Annals of the Reign of Elizabeth*; *A Collection of Ancient English Historians*; *An Account of the Monuments and Inscriptions in Westminster Abbey*; and a *Narrative of the Gunpowder Plot*. He died at the age of 72, and was buried in Westminster Abbey. He endowed a professorship of history at Oxford. The 'Camden Society,' for the publication of early historical remains, is named in his honor.

CAME, v. *kām*: pt. of COME, which see.

CAMEL

CAMEL, *kām'el* [OF. *chamel* or *camel*—from L. *camēlus*; Gr. *kamēlos*; Ar. *gamal*], (*Camelus*): genus of quadrupeds of the order *Ruminantia*, of which only two species exist, both of great use to mankind. This genus is the type of the family *Camelidae*, to which there belongs only one other genus, *Auchenia* (q.v.), including the llama, alpaca, etc. The whole number of species of *Camelidae* is, therefore, very small, and they seem to belong originally to limited regions, both in the old world and in the new. To the peculiarities of these regions, they exhibit a wonderful completeness of adaptation. The family is regarded as forming a sort of link between the orders *Ruminantia* and *Pachydermata*. The dentition differs from that of all other ruminating animals, particularly in the presence of incisors or cutting-teeth in the upper jaw; camels having also canine teeth in both jaws, and the llama and its congeners in the lower jaw of both sexes; and differences equally important appear in the feet, which have not the cloven hoof common to all the rest of the order—two short toes with separate hoofs adapted to one another—but two elongated toes, each tipped with a small nail-like hoof, the feet resting not upon the hoofs, but upon elastic pads or cushions under the toes.—In the camels,

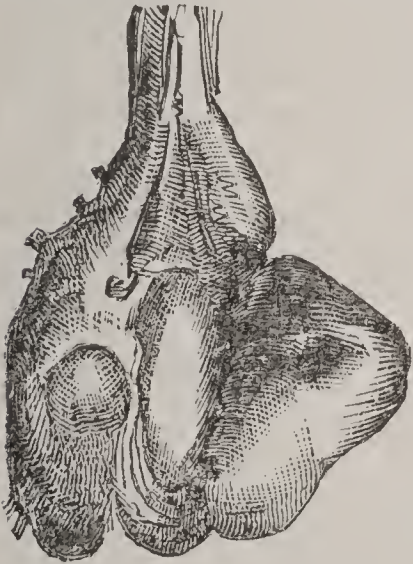


Bactrian Camel.

the toes are united by a common sole, thus resting upon one extended pad, instead of having each a separate one, as in the genus *Auchenia*; the broader expanse of the foot enabling the animals of the one genus more easily to traverse the loose sand of the desert, while the separation of the toes in the other is suited to the uneven surface of rocky heights. The camels are also distinguished by the females having four teats, while those of the other genus have only two; and by a hump or two humps upon the back, of which the llama and its congeners exhibit no trace. The long neck, small head, prominent eyes, and tumid and cleft upper lip, with considerable prehensile power, are common to both genera; but with much similarity of form, as well as of particular characters, the *Camelidae* of the Andes exhibit a gracefulness of outline which strongly contrasts with the gaunt angularity of those of the eastern deserts. Camels are indeed animals of uncouth appear-

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ance. Of the two species, that known as the Arabian C. (*C. Dromedarius*) has only one hump on the back, while the Bactrian C. (*C. Bactrianus*) has two. Some confusion has arisen from the occasional employment of the name dromedary (q.v.) as a designation of the former species; the name properly pertains to a particular variety of that species, more slender and graceful than the ordinary variety, and of much greater fleetness. Without the C. many a wide desert, now crossed by commercial lines, would be impassable by man. The hump on the C.'s back is a wonderful provision of nature, to adapt the animal to endure long abstinence from food, or to subsist on very scanty supplies; being, in fact, a store of fat, from which the animal draws as the wants of its system require; and the Arab is very careful to see that the hump is in good condition before the commencement of a journey. Sir Samuel Baker says a camel carrying a load of 400 lbs. requires water every third day, that is, every 90 m., but can in case of necessity do four days quite well. In cold weather it will work seven or eight days without drinking; when only grazing, some camels drink only once a fortnight. Beyond its limit the C. gets ill and dies. After it has been much exhausted, three or four months of repose and abundant food are necessary to restore it. The backbone of the C. is as straight as that of other quadrupeds.—Another very interesting adaptation to the desert is to be noticed in the thick sole which protects the feet of



Inside of a Camel's Foot:
A, is the cushion on which the animal treads, shown as lifted out of its bed.

the C. from the burning sand, and in callosities of similar use on the chest and on the joints of the legs, upon which the C. rests when it lies down to repose, or kneels, as it does for various purposes, and is taught to do that it may be loaded, or that its rider may mount upon its back.—The wedge-shaped cutting-teeth of the lower jaw are also particularly fitted for browsing on shrubby plants, such as the desert produces—the camel's thorn, tamarisk, etc., which form a large part of the food of the C.; the eyes are furnished with long eyelashes, to protect them from the glare and from the drifting sand; while the exclusion of the sand from the nostrils is also provided for by a power of closing their oblique openings at will. But most interesting of all is the provision made for the C.'s endurance of long drought, by the lining of the inside of the second stomach, or honey-comb bag, and of a portion of the first stomach or paunch, with great masses of cells, in which water is stored up and long retained. This store of water is well known to the Arabs, who, when sore pressed by thirst, sometimes avail themselves of it by killing some

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of the camels of the caravan.—The first stomach of the *Camelidæ* is divided into two compartments by a muscular band—one of the points of difference between them and the other ruminants. Muscular bands, proceeding from this principal one, and intersected by other muscular bands, nearly at right angles, form the cells for containing water. It may be added here, that the senses both of sight and smell are extremely acute in the C., and that it is capable of discerning water at a great distance.

The Arabian C. carries twice the load of a mule. The Bactrian C. is sometimes loaded with 1,000 or even 1,500 lbs. weight, though not generally with so much. The East India Company had at one time a corps of camels, each mounted by two men armed with musketoons. The use of the C. for the conveyance of travellers and merchandise has won it the name of the *ship of the desert*. A caravan sometimes contains 1,000, sometimes even 4,000 or 5,000 camels. The supply of food carried with the caravan for the use of the camels is very scanty: a few beans, dates, carob-pods, or the like, are all that they receive after a long day's march, when there is no herbage on which they may browse. The pace of the loaded C. is steady and uniform, but slow; it proceeds, however, from day to day, accomplishing journeys of hundreds of miles at a rate of about $2\frac{1}{2}$ m. per hour. Some of the slight dromedaries, however, can carry a rider more than 100 m. in a day. The motion of the C. is peculiar, jolting the rider in a manner extremely disagreeable to those unaccustomed to it; both the feet on the same side being successively raised, so that one side is thrown forward, and then the other.

The C. produces only one young one at a time, or rarely two. It lives 30 or 40 years.

The patience of the C. has been celebrated by some authors; and the cries by which it expresses its sense of injury when a heavy load is placed upon its back have been pathetically described. With all its general submissiveness, however, the C. is resentful of injury, and during the rutting season it becomes particularly vicious.

The flesh and the milk of the C. are much valued by the Arabs as articles of food. The dung is used for fuel, and it was from the soot of this dung that the sal-ammoniac formerly imported from Egypt was obtained by sublimation, while the sources from which that substance is now procured were unknown. The hair is used for the manufacture of cloth, some kinds of which are coarse, others comparatively soft and fine. C.'s hair is also imported into Europe for the manufacture of the pencils or small brushes used by painters. The C. can now scarcely be said to exist anywhere in a wild state. It has lately been introduced into Australia.

A fossil species of C. (*C. Sivalensis*), larger than either of the existing species, has been discovered in the tertiary deposits of the Sewalik Hills, in Hindustan.

CAMEL, *kām'el*: machine for floating vessels over shoals and sand bars; invented in Holland abt. 1688 to carry ships across the Zuyder Zee. A long caisson is

CAMELEON—CAMELLIA.

secured to each side of the vessel and filled with water; this being pumped out, the camels in rising lift the ship with them. The contrivance has been used at New Bedford and Nantucket, as also in raising sunken vessels. The same principle is followed in floating docks.

CAMELEON, n. *kă-mē'lě-ŏn*: for CHAMELEON, which see.

CAMELFORD, *kă'm'el-fěrd*: town in the n.w. of Cornwall, England, near the source of the Camel (crooked brook), 14 m. w. of Launceston. It lies in a high and hilly tract near the moors. C. is said to have been the scene of a battle, 542, between King Arthur and Mordred, his nephew, when both were slain. The West Saxons, under Egbert, had a battle with the Britons here, 823. The ruins of King Arthur's Castle, Tintagel, stand on the high rocky coast, 4 m. n.w. of Camelford. Two m. n. of C. are the celebrated slate quarries of Delabole, employing a large number of men. Pop. of C. abt. 1,600.

CAMELLIA, n. *kă-mēl'ĭ-ă* [after *Camellus*, a Moravian Jesuit, and traveller in Asia]: genus of plants of the nat. ord. *Ternstræmiaceæ* (q.v.), natives of China, Japan, and the n. of India—some of which are now among the most admired green-house shrubs in other countries too cold for their cultivation in the open air. They have been developed by florists into an endless multiplication of beautiful hybrids and varieties. The best known and most esteemed is *C. Japonica*. Its leaves are ovate-elliptical, almost acuminate and serrate, shining; the flowers without stalks, mostly solitary, large, and rose-like. It is a native of Japan; and there and in China it has been carefully cultivated from time immemorial. In its wild state it has red flowers; and the red single C. is much used by gardeners as a stock on which to graft the fine varieties, the flowers of which are generally double, and in many cases completely so. Many of them are of Chinese or Japanese origin; many have been raised by cultivators in Britain, continental Europe, and America. Their colors are very various; and the varieties also differ much in the form and position of the petals. It adds to the value of the C. that its flowering time is in autumn, winter, and spring. Sometimes entire houses are devoted to the culture of camellias. Some cultivators are careful to protect them from direct sunshine, others recommend an opposite treatment: it is agreed by all that free access of air is of great importance, and that water must be given very liberally, yet with such caution that the soil may never remain soaked after the immediate wants of the plant are supplied. The cultivation of camellias in the windows of houses is often attended with disappointment, from the buds dropping off when almost ready to expand, which is generally owing either to a neglect or an excess of watering; an apparently slight mistake in either direction working speedy damage. Too much heat at this time is also apt to cause the flower buds to fall off. The C. flowers well when the temperature is kept not very much above

CAMELOPARD—CAMEO.

the freezing-point, but frost it cannot bear. The proper soil for camellias is a loose black mold; a little sand and a little peat are often advantageously mixed with loam to form it. Camellias are propagated often by cuttings, often by layers; but the finest varieties generally by grafting or by inarching. The single C. is also propagated by seed, and in this way the best stocks for grafting are procured.—Of the other species of C., the most hardy, and one of the most beautiful, is *C. reticulata*, from which many varieties now in cultivation are partly derived.—*C. oleifera* is extensively cultivated in China—not, however, in the more northerly parts—for its seeds, from which an oil is expressed after boiling, very similar to olive oil, and much in use as an article of food and otherwise in the domestic economy of the Chinese. The seeds of almost all the species, however, yield this oil.—*C. Sasanqua* bears the name of SASANQUA TEA. It is cultivated in China for its flowers, said to be used for flavoring certain kinds of tea.

CAMELOPARD, n. *kām-ěl'ō-pârd* [L. *camēlus*, a camel; *pardālis*, the female panther]: the giraffe; a wild animal with a long slender neck and spotted skin: see GIRAFFE.

CAMEL'S THORN (*Alhagi*): genus of plants of the nat. ord. *Leguminosæ* (q.v.), sub-order *Papilionaceæ*, containing a number of herbaceous or half-shrubby species, natives chiefly of the deserts of the east, having simple leaves, minute stipules, racemes of red flowers, and jointed pods with one seed in each joint. These plants are of great importance on account of the food which they afford for camels, where other vegetation is scant; and camels are particularly fond of them. *A. camelorum*, a herbaceous species, yields a kind of Manna (q.v.), in drops, as of honey, on the leaves, afterward hardening. A similar exudation is yielded by *A. Nipalensis*, another herbaceous species; but it is not certain that the manna of Persia and Bokhara is produced, as has been alleged, by *A. Maurorum*, a shrubby species two or three ft. in height, which certainly does not yield it in India or Egypt: the supposition that this exudation results from some peculiarity in the climate of Persia and Bokhara, is less probable than that of a mistake concerning species not very dissimilar.

CAMENZ, or KAMENZ, *ká'měnts*: town of Saxony, on the Black Elster, 22 m. n.e. of Dresden. It has manufactures of earthenware, starch, tobacco, etc. C. was burned 1742. Lessing was born here 1729, and a hospital dedicated to his memory 1826, Jan. 3. Pop. 6,406.

CAMEO, n. *kām'ě-ō* [It. *cammeo*: F. *cameieu*—said to be from Pers. *camahen*, loadstone, as having been first employed for signets]: gems engraved in relief; as distinguished from those that are hollowed out so as to yield a raised impression, which are called *Intaglios*. The term C., however, is applied more especially to those diminutive pieces of sculpture which are prepared from precious stones having two strata or layers of different colors, the undermost of which is left to form the background, the object to be represented being cut in the upper one. The stone gener-

ally used for this purpose by the ancients was the variegated onyx.

The art of C.-cutting is of great antiquity. It is believed to have been of Asiatic origin, and to have been practiced by the Babylonians, from whom the Phœnicians carried it into Egypt. From the Egyptians it was transmitted to the Greeks, who brought it to great perfection; and afterward it was practiced extensively, and more successfully than perhaps any other art, in Rome. To what extent the gems commonly called Etruscan are in reality early Greek, is a subject of dispute among the learned. It was not till a comparatively late period—the age following Praxiteles—that C.-cutting became popular in Greece; and it was chiefly in the courts of the successors of Alexander that it was patronized. At this period cameos were extensively used, not only as personal ornaments, but in cups, vases, candelabra, and other objects of domestic luxury. Pateræ and other vessels were frequently worked out of a single stone, upon which were exhibited a whole series of figures of exquisite workmanship. Many antique cameos which have been preserved are wonderfully beautiful both in design and execution. The finest known specimen is said to be the Gonzaga C., formerly at Malmaison, now at St. Petersburg. It represents the head of a prince and his wife, probably Ptolemy I. and Eurydice. Winckelmann mentions a C. representing Perseus and Andromeda, in such high relief, that almost the whole contour of the figures, which are of the most delicate white, is detached from the ground. It belonged to the painter Mengs, and at his death was purchased by the Empress Catharine of Russia. The only other gem which Winckelmann is disposed to rank with that just mentioned, is ‘the Judgment of Paris’ in the cabinet of the Prince Piombino at Rome. Of cameos of the Roman time, many fine specimens are in the continental museums. The most celebrated C. in England is the ‘Cupid and Psyche’ in the Marlborough collection, by Tryphon, who is supposed to have lived in Macedon under the immediate successors of Alexander. The stones on which many of these cameos are cut are of surprising, and, in modern times, unequalled size and perfection. They are supposed to have been procured by the ancients through their oriental and African commerce. Cameos do not seem to have been made in mediæval times; but the art revived in Italy, under the auspices of the Medici; and the production of cameos, both in *pietra dura* and in shell, has there become a branch of art-manufacture of considerable importance. Impressions from antique cameos in glass, sulphur, porcelain, and other materials, are produced in many places; and for artistic purposes, possess all the value of the originals.

Glass Cameos.—The manufacture of cameos from artificial substances was known to the ancients. One of the most beautiful specimens of an imitation of C. in glass is the famous Barberini or Portland vase, now in the British Museum. The ground is blue; the figures, in low relief, of a delicate, half-transparent white: see PORTLAND VASE.

CAMERA.

Many fragments of the same kind of manufacture are in other cabinets, but this is believed to be the only perfect example.

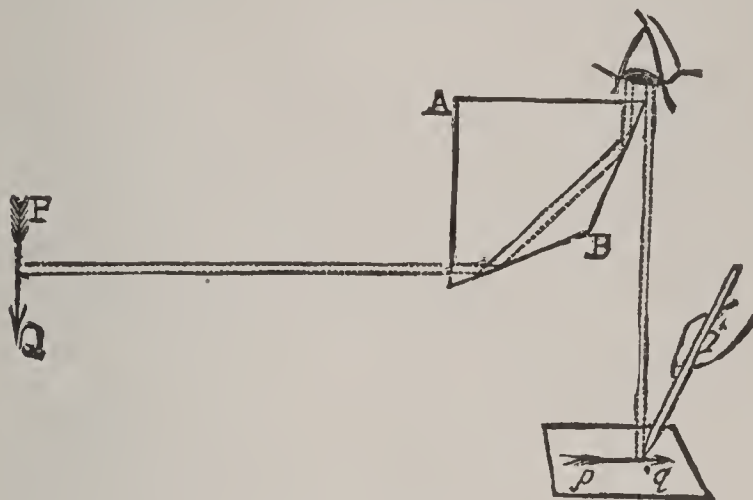
Shell Cameos.—The art of imitating cameos in shell, which has now attained such perfection as to rival the delicacy and finish even of antique workmanship, and which is a process quite as artistical as their production from gems, is of modern invention. The shells, like the stones, chosen for this purpose, are such as possess layers of different colors. The most useful are the *Bull's Mouth*, the under layer of which is red, resembling the sardonyx; the *Black Helmet*, which has a dark onyx ground; and the *Queen's Conch*, of which the ground is pinkish. These shells have three strata, the undermost of which forms the ground, the figure being sculptured in the second, and the third serving to mark the hair, wreaths, armor, and other more prominent objects. The portion of shell having been prepared of the requisite size, form, and thickness by various mechanical means, it is fixed by some adhesive substance—usually rosin—to a small block of wood, of such form and thickness as to be conveniently grasped by the artist in his left hand. The outline of the object or objects to be represented is then sketched with a pencil, and, in the case of portraits, is usually copied from a previous pencil-sketch on paper. The pencil-marking on the shell is then followed with a scratch-point, and the surrounding white substance is removed by means of files and gravers. This latter process, which is more mechanical than the rest, is usually performed by an assistant. The artist then proceeds slowly and carefully to work out his subject by the use of smaller tools; those used at last for deepening the finer lines being scarcely larger than ordinary darning-needles. The manufacture of shell-cameos in Rome began about 1805, and is said to have been of Sicilian origin. The art was at first confined to Italy; but during the last 35 years, it has been carried on in Paris to a greater extent than even in Rome, though not with equal success. A large proportion of the whole cameos manufactured in France are imported into England, and many of them are mounted as brooches, and exported to the United States and the British colonies. Saolini and Giovanni Dies have long been celebrated as artists in shell-cameo in Rome, while Girometti has enjoyed a similar reputation for his works in *pietra dura*.

CAMERA, n. *kām'ēr-ă* [L. *camĕra*; Gr. *kamăra*, an arched roof, a chamber: It. *camera*]: a chamber or compartment for exhibiting, by means of reflection, any external thing; a reflection or miniature of the thing or house. CAMERA-LUCIDA, *-lŏ'si-dŭ* [L., a light chamber]: an instrument for so reflecting images of objects on paper, etc., as to allow them to be sketched. CAMERA-OBSCURA, *-ŏb-skŭ'ră* [L., dark chamber]: a darkened chamber or box, in which, by means of lenses, external objects, in their natural colors, are exhibited on any white flat surface within it. CAM'ERATED, a. *-ă-tĕd*, divided into chambers, as certain shells; arched. IN CAMERA, in a council-chamber; in a private

CAMERA LUCIDA.

room, when the matter or cause is not fit for the open court; in their private rooms to hear applications, as judges.

CAMERA LUCIDA, *kām'ēr-a ló'sī-da*: optical instrument for reflecting images of objects on paper, etc. Dr. Wollaston's C. L., intended to facilitate the perspective delineation of objects, consists of a small quadrilateral prism of glass, of which AB in the annexed figure is the perpendicular section, held in a brass frame, which is at-



Camera Lucida.

tached to an upright rod, having at its lower end a screw-clamp, to fix it to the edge of a table. The prism being at the height of about a foot from the table, has its upper face horizontal. Two of its faces, as in the figure, are at a right angle at A; the contiguous faces make respectively with them angles of $67\frac{1}{2}^{\circ}$; so that the remaining obtuse angle at B contains 135° . Rays coming from an object PQ, and falling nearly perpendicularly on the first surface, enter the prism and undergo total reflection at the contiguous surface (see DIOPTRICS); they then fall at the same angle on the next surface, and are totally reflected again; finally, they emerge nearly perpendicularly to the remaining surface. An eye, as in the figure, then receives the emergent pencil through one part of the pupil, so that an image, *pq*, of the object is seen projected upon a sheet of paper upon the table. The rays from the drawing pencil passing the edge of the prism, enter the other part of the pupil; and the pencil and image being seen together upon the paper, a sketch of the latter can be taken. There is, however, a practical difficulty—the image and the drawing-pencil are at distances sensibly different from the eye, and so cannot be seen together distinctly at the same time. To obviate this, a plate of metal, with a small aperture as an eye-hole, is placed at the edge under the eye, so that the rays through the prism, and those from the drawing-pencil, which both pass through the eye-hole, form only very small pencils. By this, the difficulty is greatly diminished. It is still, however, difficult to use the instrument satisfactorily; and though many acquire great readiness in its use, others have never been able to attain facility. The instrument is remarkable for its small

CAMERA OBSCURA.

bulk and portability. A good one will pack in a box 8 inches by 2, and half an inch deep. Besides this common form of the C. L., there are others. Its simplest form is merely a piece of smooth glass fixed at an angle of 45° to the horizon. An image from a horizontal object falling on this glass will be perfectly reflected, and that in the vertical, so that the eye looking vertically down will see the image, and, owing to the transparency of the glass, the artist will be able to trace it out upon paper below. In this case, however (see CATOPTRICS), the image will be inverted.

CAM'ERA OBSCURA, *ób-ské'ra*: optical instrument for exhibiting in a darkened chamber or box external objects in their natural colors; invented by Baptista Porta in the 16th c. It is familiar in its simplest form as a toy, consisting of a rectangular box, furnished at one end with a lens whose focal length is equal to the length and depth of the box, at the opposite end of which a plane reflector is placed at an angle of 45° , which throws the image of any objects to which the lens may be directed on a piece of ground-glass on the top of the box in a non-inverted position, so that they may be viewed or sketched from as in nature. The C. O. being now indispensable in the practice of photography, has received a number of recent improvements, which make it a scientific instrument. The principle, however, involved in the simplest and most refined forms is the same, and may be illustrated

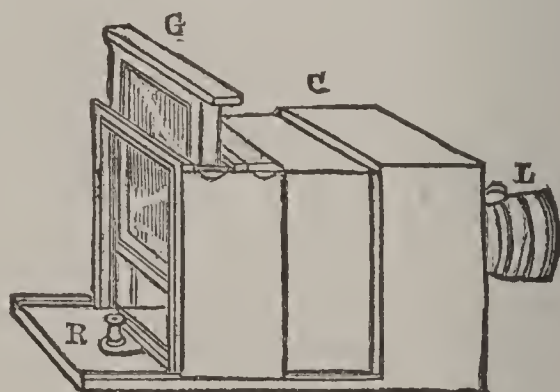


Fig. 1.

and made intelligible by the following experiment: Let a small hole be bored in a window-shutter, and the room be darkened. If, now, the beam of light entering the room by this hole be intercepted by a sheet of white paper, held at a small distance from the hole, an inverted image of objects without will be seen upon the paper. By placing a small convex lens over the hole, this image is rendered much more distinct, or *sharp*, in photographic language. Moreover, it will be found that, at a certain distance from the hole, the image attains a maximum degree of sharpness; and that if the paper be removed from this point to any position either nearer to the hole or further from it, the image becomes indistinct and confused. At the point of greatest distinctness, the image is said to be *focused*. Such being the principle of the camera,

it is evident that in practice the instrument may assume many forms, provided always that it consists of a darkened box or chamber having a hole at one end for the insertion of a lens, or combination of lenses, and at the other a screen, generally made of ground-glass, on which to receive the image. Fig. 1 will at once give an idea of a very common and simple form of camera. C is the body of the instrument, made of any opaque substance; L, the tube or tubes, generally formed of brass, and containing one or more lenses; G, the obscured or ground-glass, upon which the image is thrown for the purpose of adjusting the focus; R, the rack behind, by means of which, and the double sides of the camera, the body of the instrument may be lengthened or shortened till the image on the ground-screen is accurately focused. This rack is most frequently placed upon the tubes carrying the lenses. The interior of the whole apparatus is blackened, to prevent reflection of the rays falling on their sides, and to impart greater distinctness to the picture. S, in fig. 2,

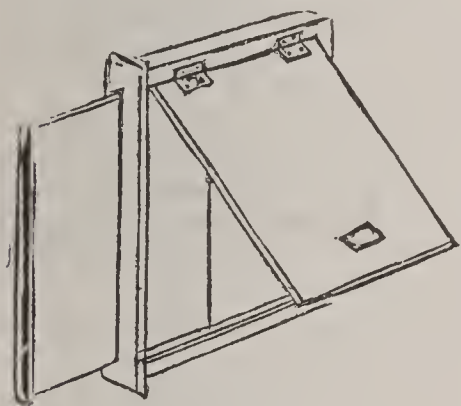


Fig. 2.

represents the *camera-slide*. This is a thin, dark box, and is used for conveying a sensitive plate from the operating-room to the camera, and back again after exposure. It consists of a rectangular frame, made to fit exactly into the back of the camera when the focusing-screen is removed. At the back is a hinged door, by means of which the plate is introduced into the slide; and in front is a shutter, which is pulled up when the plate is to be exposed, and shut down after the time requisite for the action of the light upon the plate has expired. It must be constructed so that, when substituted for the focusing-screen G (fig. 1), the surface of the prepared plate, which is intended to receive the image, shall correspond exactly in distance from the lens with the ground-surface of the focusing-screen. The plate rests upon projections of silver wire in the corners of the slide; and the same slide may be used for plates of different sizes, by introducing into it thin frames of suitable dimensions also furnished with silver-wire corners.

Photographic cameras are generally required for one of three purposes—viz., portraits, landscapes, or copying; and for each of these it is necessary to make suitable modifications in the construction of the instrument. A camera has, however, been recently contrived which combines within itself the conditions necessary for all contingencies. It is called Martin's universal portrait, landscape, and copying camera, and consists, primarily, of a base-board, 30 inches long and 11 inches wide, divided into three pieces, and hinged together by means of broad brass hinges, so as to diffuse the bearing as much as possible,

CAMERARIUS—CAMERON.

and bolted together when in use by sliding panels of mahogany, extending across the entire width of the base-board. This base-board, being grooved on its outer edges, allows the sliding portions of the camera to be moved from one end to the other, so as to alter the relation between object, lens, and image *ad infinitum*.

What may be regarded as the body of the camera, is of the same construction as an ordinary expanding camera (fig. 1), except that it is furnished with additional apertures for camera slides, and the front (C) and the back are united by means of an accordion or bellows body of suitable length to extend from one end of the base-board to the other.

CAMERARIUS, *kâ-mâ-râ're-ûs*, **JOACHIM** — originally, *Liebhard*, which name he changed into C. because his forefathers had been *Kämmerer* (chamberlains) at the court of the Bishop of Bamberg: 1500, Apr. 12—1574, Apr. 17; b. Bamberg, Germany. He was by nature earnest and taciturn; but the extent of his knowledge, his sobriety of opinion, strength of character, and, on occasion, overpowering eloquence, won for him the esteem of all his contemporaries. He died at Leipsic after a life devoted to literature. His works, of which several are still valuable, include an excellent biography of Melanchthon, and a collection of letters by this reformer; also annotations on Cicero's *Quæstiones Tusculanæ* (1525), *Elements of Rhetoric*, *Commentarii Linguae Græcæ et Latinæ* (1551), and *Epistolæ Familiares* (1583-95), giving interesting notices of his times.

His son, **JOACHIM C.** (1534-98), was one of the most learned physicians and botanists of his age.

CAMERARIUS, **RUDOLPH JAKOB**: 1665-1721: German botanist, in charge of the botanic garden at Tübingen. To him is ascribed the discovery of the sexual relation in plants. He was also a medical professor.

CAMERINO, *kâ-mâ-rê'nô* (anc. *Camerinum*): town of central Italy, province of Macerata, on a hill at the foot of the Apennines, 41 m. s.w. of Ancona. It has a cathedral, occupying the site of a temple to Jupiter, a university, and some manufactures of silk. Its bishopric dates from the 3d c.; and it was made an archiepiscopal see 1787. Pop. 4,500.

CAMERLENGO, n. *kăm'er-lěng'gō* [It. *camerlingo*, a chamberlain]: one of the highest officers of the Roman court. A **CARDINAL CAMERLENGO**, during a vacancy in the holy see, takes charge of all the temporalities, and presides over the apostolic chamber or palace.

CAMERON, *kăm'er-ŭn*, **JAMES DONALD**: banker: b. Middletown, Dauphin co., Penn., 1833, May 14; son of Simon C. He graduated at the College of N. J. 1852; entered the Middletown bank as clerk, and afterward became its cashier and pres.; was pres. of the Northern Central railroad co. of Penn. 1863-74; sec. of war 1876-7; delegate to the national republican conventions 1868 and 76; chairman national committee and delegate to the national convention 1880; succeeded his father as U. S. senator 1877

CAMERON.

and was re-elected 1879 and 85. In 1890 he was chairman of the committee on naval affairs, and member of the committees on coast defenses, milit. affairs, inquiry into claims of citizens of the United States against Nicaragua, the civilized tribes of Indians, and the quadro-centennial.

CAMERON, *kām'ér-in*, JOHN: abt. 1580-1625; b. Glasgow; scholar and divine. He was educated at the univ. of that city, where, in his 20th year, he held an appointment as reader in Greek. In 1600, he set out to travel in France, where his ability and erudition secured for him a philosophical professorship in the Univ. of Sedan. He afterward acted as a Prot. clergyman at Bordeaux, and, on the death of Gomarus, was appointed to the divinity chair in the Univ. of Saumur, which he held until 1620. Returning to Britain, he was appointed prof. of divinity at Glasgow; but in less than a year he returned to Saumur; thence to Montauban, where he received a divinity professorship. Here his opposition to the party who advocated a civil war made him many enemies, by one of whom he was stabbed in the street; and he died from the wound. He was considered one of the best scholars of his time; in biblical criticism, he was inclined to be perverse, usually in difficult passages choosing the opposite view to that held by other divines, especially Beza. His theological opinions inclined to looseness, his works being said to be the foundation of Amyraut's doctrine of universal grace.

His followers in France became a sect known as Cameronites, moderate Calvinists, holding that man's will is determined only by his practical judgment, so that the will is not physically or otherwise coerced by God, but only moved morally by Him through infusing knowledge into the mind. This doctrine which has found favor with some eminent theologians, is doubtless an unconscious modification of Calvinism in the minds of many adherents of that doctrine.

CAMERON, RICHARD: a Scottish Presbyterian preacher who suffered death, 1680, July 20, as an irreconcilable upholder of the 'Covenant,' and from whom the religious sect of Cameronians (q.v.) was named. C. belonged to the extreme party, who held by the perpetually binding obligations of the Solemn League and Covenant (see COVENANTS), which were set aside at the restoration of Charles II. With some others, he strenuously resisted those measures that reinstated the Episcopal Church in Scotland, and that proscribed the meetings for public worship of unauthorized religious bodies. Contrary to law, he persisted in preaching in the fields, and became obnoxious to government, to which, indeed, he finally assumed an attitude of defiance. In 1680, June, he, in company with about 20 persons of equal zeal, well armed, entered the town of Sanquhar; and in the market-place they formally renounced their allegiance to Charles II., who had so grossly abused his power, and declared war against him and all his adherents. After this act, they retired to the hills between Nithsdale and Ayrshire, where they evaded capture for a month, though a price of 5,000 merks had been set upon C.'s head by government, and 3 000 upon the heads of the others. They were sur-

CAMERON—CAMERON HIGHLANDERS.

prised by a vastly superior force in Aird's Moss, and after a brave fight, C was killed. His hands and head were cut off, and fixed upon the Netherbow Port, Edinburgh. C. ranks as a martyr, and has an honorable place in the history of *Scots Worthies*.

CAMERON, SIMON: 1799, Mar. 8—1889, June 26; b. Lancaster co., Penn.: statesman. He received a limited education; learned the printer's trade; worked in Lancaster, Harrisburg, and Washington, became editor of a newspaper in Doylestown 1820 and in Harrisburg 1822; engaged in railroad construction and banking; was appointed adjt.gen. of Penn.; succeeded James Buchanan as U. S. senator 1845 and acted with the democrats; joined the people's party, voted for Gen. Fremont for pres., and was again elected U. S. senator 1856; joined the republican party and was delegate to the convention that nominated Abraham Lincoln 1860; was sec. of war 1861-2; U. S. minister to Russia 1862; re-elected U. S. senator 1866 and '72; succeeded Charles Sumner as chairman of the committee on foreign affairs 1872; and resigned as senator and was succeeded by his son, JAMES DONALD C., 1877. He spent his last years in foreign travel, and in the quiet retirement of his Donegal estate.

CAMERON, VERNEY LOVETT, D.C.L.: explorer: b. Radipole, Dorsetshire, England, 1844, July 1. He was educated at Bruton, Somersetshire; was appointed cadet in the British navy 1857; promoted midshipman 1860, sub-lieut. 1863, lieut. 1865; commander 1876, and was retired 1883. He served in the Abyssinian war; accompanied Sir Bartle Frere on the special mission to Zanzibar; took charge of the East Coast Livingstone Search Expedition organized by the Royal Geographical Soc.; and after Livingstone's death terminated the purpose of the expedition, crossed tropical Africa on foot from e. to w.—nearly 3,000 m. In this journey he followed the course of the Lualaba river, which he discovered belonged to the Congo instead of the Nile, as previously believed, explored 1,200 m. of new country, and located the watersheds between the Nile, Congo, Zambesi, and other rivers. He visited Syria and Mesopotamia 1878-9; with Richard F. Burton undertook a journey of exploration in the country beyond the Gold Coast Colony 1880; and after 1888 was very active in exposing the horrors of the slave trade in central Africa. He had published several accounts and surveys of his travels, was honored with numerous medals and decorations, and received the hon. degree D.C.L. from Oxford University. D. 1894, Mar. 26.

CAMERON HIGHLANDERS (the Queen's Own Cameron Highlanders): the designation of the 79th regt. of infantry in the British service, in consequence of the corps having been raised by Allan Cameron, of Erroch, 1793. Originally it consisted of 1,000 men, but a second battalion was added 1804. This gallant regiment, which wears the Highland garb, performed distinguished services in the Peninsula and at Waterloo, and in the chief warlike struggles of more recent times.

CAMERONIAN—CAMERONIANS.

CAMERONIAN, n. *kām'ēr-ō'nĭ-ăn*: a follower of Richard Cameron, in Scotland, who refused to accept the indulgence granted by Charles II. to the Presbyterian clergy; one of an extreme Presbyterian sect.

CAMERONIAN REGIMENT, *kām-ēr'ō'nĭ-an*, now **CAMERONIANS** (Scottish Rifles): long the 26th infantry regt., had its origin in a body of Cameronians (q.v.) during the revolution of 1688. Taking advantage of their zeal and courage, the convention which sat at Edinburgh induced a number of them to assist in the revolution, which it was imagined by some was to re-establish the Covenants (q.v.). They were induced to enlist on the understanding that the special object of the corps was 'to recover and establish the work of reformation in Scotland, in opposition to popery, prelacy, and arbitrary power, in all the branches and steps thereof, till the government in church and state be brought to that lustre and integrity which it had in the best of times.' (See Burton's *History of Scotland*, i. 49.) Thus was formed the celebrated C. R., with the youthful Lord Angus as col., and William Cleland as lieut.col. and actual commander. Under Cleland, not yet in his 30th year, the regiment was sent northward to quell the insurrection, after the fall of Viscount Dundee. Surrounded by from 4,000 to 5,000 Highlanders, the Cameronians, only 800 strong, gallantly defended themselves during a whole day in Dunkeld, 1689, Aug. 21. In this terrific struggle, the brave Cleland was killed. Considering the issue of the revolution, they had been entrapped into military service, and their employment on foreign service afterward greatly scandalized the Cameronian sect. The regiment has ever done credit to its origin, being distinguished alike for gallantry and for good conduct.

CAMREO'NIANS: religious sect in Scotland properly named after Richard Cameron (q.v.). Its official designation, however, is that of Reformed Presbyterian. No doubt, the principles of the body are those for which Cameron contended and died: but not till after 1688 did the small body of Presbyterians, who insisted upon the restoration of the civil and ecclesiastical polity of 1638-49 in opposition to the Revolution settlement, assume a distinct form. According to the Solemn League and Covenant, ratified by the parliaments of England and Scotland, also by the Assembly of Divines at Westminster 1643, Presbyterianism was to be maintained in the kingdoms of England, Scotland, and Ireland, and popery, prelacy, superstition, heresy, schism, etc., were to be extirpated. As a measure of pacification, Presbyterianism was established in Scotland by act of parliament, 1690; but it was of a modified kind, rendering the church a creature of the state, particularly as regards the calling of general assemblies. Equally to the disgust of the extreme party referred to, prelacy was confirmed in England and Ireland, and there was a general toleration of heresy—i.e., dissent. In sentiment, if not in form, therefore, this party repudiated the government of William III. and his successors, and maintained the perpetually binding obligations of the Covenants. Unquestionably, these C.

CAMERONITES—CAMEROONS.

acted under strong convictions, and only desired to carry to a legitimate issue theoretical principles of the Church of Scotland which, for prudential considerations, have been practically in abeyance; and in the standards of this sect is found a true embodiment of the tenets held by the great body of English and Scotch Presbyterians of 1643. Although thus an elder sister of the existing Church of Scotland and all its secessions, it was with some difficulty that, after the Revolution, it organized a communion with ordained ministers. The steadfastness of members was put to a severe trial by the defection of their ministers; but in 1706, after their faith and patience had been tried for 16 years, they were joined by the Rev. John M'Millan, from the Established Church; and shortly afterward by the Rev. John M'Neil, licentiate of the same church. To confirm the faith of members, and give a public testimony of their principles, the covenants were solemnly renewed on Auchen-sauch Hill, near Douglas, Lanarkshire, 1712. The subsequent accession of the Rev. Mr. Nairne enabled the C. to constitute a presbytery at Braehead, in the parish of Carnwath, 1743, Aug. 1, under the appellation of the Reformed Presbytery. Other preachers afterward attached themselves to the sect, which continued obscurely in the w. of Scotland and n. of Ireland. For their history and tenets see the *Testimony of the Reformed Presbyterian Church* (Glasgow, John Keith, 1842). Holding strictly to the covenants, and in theory rejecting the Revolution settlement, the political position of the C. is very peculiar, as they refuse to recognize any laws or institutions which they conceive inimical to those of the kingdom of Christ; from which cause many of them formerly isolated themselves from general society, and refused several of the responsibilities and privileges of citizens. In 1860, there was an attempt on the part of some of the kirk-sessions to prevent the members becoming volunteers, on account of the oath of allegiance which required to be taken. On the question coming before the synod, it was decided (1863) that excommunication for taking the oath should cease. In consequence of this decision, 10 or 12 congregations seceded. In 1876, the larger body of the Reformed Presbyterians, consisting of about 45 congregations, was formally united to the Free Church of Scotland, so that the distinctive features of the Cameronians are now represented by the few congregations which seceded 1863.

CAM'ERONITES: see CAMERON, JOHN.

CAMEROONS, *kām-er-ônz'*: river of Upper Guinea, Africa, which enters the Bight of Biafra from the n.e.; abt. lat. 4° n., long. 9° 40' e., by an estuary some 20 m. in breadth. Its length is not known, but for 40 m. upward its breadth averages nearly a quarter of a mile, its depth varying in the dry season from 2 to 20 ft. The left bank of the river is steep and high, the right for many miles low and swampy, and covered with mangroves. There are several populous and thriving villages on its banks, whose inhabitants carry on an extensive trade in palm-oil, and ivory, obtained in great quantity from dead elephants, which have perished in search of water in a great morass inland.

CAMEROONS—CAMISADE.

CAMEROONS, CAPE: point on one of the islands of the Cameroons estuary.

CAMEROONS PEAK: culminating point in the Cameroons Mountains, which in lat. $4^{\circ} 13'$ n., and long. $9^{\circ} 10'$ e., has an elevation estimated at 13,000 ft.

The mountains cover abt. 700 sq. m., bordered on the w. and s. by the Gulf of Guinea. The lower sides have a dense growth of tropical trees. Above 8,000 ft. are many volcanic craters, and an eruption is said to have occurred 1838.

CAMETA, *ká-mā'tá*: town of Brazil, on the Tocantins, which joins the estuary of the Amazon, from the s. It has a fertile district attached to it, with estimated pop. 20,000.

CAMILLA, *ka-míl'la*: swift-footed virgin in ancient Roman fable; said to be daughter of king Metellus.

CAMILLUS, *ka-míl'lŭs*, **MARCUS FURIUS**: celebrated Roman patrician, who first appears as consular tribune, B.C. 403; d. Rome, B.C. 365. His military career was a series of unbroken successes, according to the accounts which have come down to us; but these accounts have been shown by Niebuhr to be largely mixed with mythological or poetic fiction. In 396, C. was made dictator, during the Veientine war, in which he mined and captured the city of Veii; but the proud splendor of his subsequent triumph offended the Roman populace, who were still further displeased when C. demanded a tithe of the spoils of Veii, in order to fulfil a vow made to Apollo, on condition of victory. In 394, C. was again elected consular tribune, and besieged the Falerii, who after bravely defending themselves, were led by a magnanimous act of C. to yield unconditionally. Afterward C., being accused of peculation, and foreseeing certain condemnation, banished himself from Rome, 391, and lived in retirement at Ardea, until Brennus, at the head of his wild Gauls, had swept through Etruria, and captured and destroyed the whole of Rome except the Capitol. C. was now recalled, and appointed dictator a second time. He achieved a decisive victory over the invaders, rebuilt Rome, and obtained new victories over the Volsci, and others. In B.C. 386, he was elected dictator for the third time, but refused the office. In 381, C. was victorious in the war of Rome against Prænestes and other Latin towns; and in 368, he was elected to his fourth dictatorship, but abdicated during the same year. In B.C. 367, when war broke out with the Gauls, C., though 80 years old, accepted the dictatorship for the fifth time, defeated the barbarians near Alba, and made peace between patricians and plebeians. After this, he erected near the Capitol a temple to Concord, and, having retired from public life, died of the plague, lamented by the whole Roman people.

CAMILLUS and **CAMILLA**: in anc. Rome, a boy and a girl taking part in sacrificial ceremonies.

CAMISADE, n. *kām'ī-sād* [F.—from F. *chemise*—from mid. L. and Sp. *camisa*, a shirt]: an attack made by soldiers in the dark—so called from their putting their shirts over their dress to distinguish each other by. **CAMIS**, n. *kām'īs*, and **CAMESE**, n. *kām-ēz'*, a shirt or smock-frock, a tunic.

CAMISARDS.

CAMISARDS, *kām'î-zârdz* or *kă-mê-zăr*: in French history, name given to the Protestants of the Cévennes who rose in revolt against Louis XIV. In 1685 the revocation of the Edict of Nantes, taking away the securities for the Prot. religion in France and suppressing its exercise, had caused on the one hand a great emigration of Huguenots, especially from the s. provinces, and on the other hand to a wide extent a formal compliance with Rom. Cath. observances. The new converts were treated with suspicion by the royal government, and on their own part were uneasy in conscience and lax in their allegiance to the persecuting power. Here and there Prot. pastors braved all dangers in order secretly to remain with their flocks. Meetings were held in the forests and among the mountains. A lull in the persecution was followed by yet more cruel acts after the peace of Ryswick. Claude Brousson, a man especially revered among the Protestants, was broken on the wheel at Nîmes in 1698 for corresponding with foreign governments. This and other such acts roused violent excitement, especially in the Cévennes mountains. Propheesyings and other manifestations of fanatical enthusiasm grew frequent. Finally one night, 1702, July, a hundred armed men, masked and wearing white shirts (whence the name *Camisards*), attacked Pont-de-Montvert and put to death the Abbé du Chayla, a noted persecutor. The Count de Broglie, military gov. of Languedoc, captured and executed several of these men. But the insurrection rapidly took on greater proportions. Nocturnal attacks were made from the mountains. The militia of the province, ill-organized or disaffected, could make no headway against the rebels. Emboldened, the C. made their attacks and exercised the rites of their religion openly. Bold and able leaders, frequently old soldiers, conducted their parties. The most celebrated of their chieftains was a young peasant, 20 years old, Jean Cavalier (q.v.), a zealous Huguenot, who had been a baker's boy at Geneva, but returning to the Cévennes, showed so great a genius for organization that all the bands of insurgents were placed under his orders. He defeated a detachment of royal troops in Dec. and seized Sauve. In 1703, Jan., one of his lieutenants defeated the Count de Broglie in person in the plain of Nîmes, where the C. burned 40 parish churches and killed 80 priests.

But the war of the Spanish succession was now in full course, and the C., conscious that they could not expect permanently to maintain the struggle alone, sent out their agents to the Prot. courts of all Europe to obtain pecuniary and military support, and also to seek aid from the prosperous Huguenot refugees in England, the Netherlands, and Germany. In England and in the Netherlands there was strong interest in their cause, not only from religious reasons but from a sense of the political advantages which the allies would derive from fostering an internal struggle against Louis XIV., and of the strategical importance of operations having the Cévennes as a basis, especially in view of their nearness to Catalonia, in which revolt against

Philip V. was anticipated. The English admiral, Sir Cloudesley Shovel, was sent with assistance; but before he could succeed in establishing connections the insurrection had begun to fail. Marshal de Montrevel, sent against the rebels with 10,000 infantry, dragoons, and artillery, had defeated Cavalier and driven the C. from the Mediterranean coast. But he conducted his operations with so much cruelty toward non-combatants as to excite more violent opposition. 31 parishes in the middle region of the Cévennes were laid waste, in order to reduce the insurgents. The expeditions of the latter grew more vindictive, especially in the hands of the *C. noirs*, so called because they blackened their faces with soot. Reprisals followed on the part of the Rom. Catholics, organized under the name of *cadets de la croix*. In 1704, Mar., Cavalier surprised a French regiment and cut it in pieces. But soon afterward his own band was almost wholly destroyed, and he escaped with difficulty; and aid from Savoy, the Netherlands, and England was inadequate, or did not arrive in season.

Impatient at the prolongation of the revolt, Louis XIV. replaced Montrevel by one of his most eminent generals, Marshal Villars, who, perceiving that, while in part the C. consisted of bandits devoted to plunder, the majority were 'Frenchmen, very capable and very brave,' proclaimed an amnesty to all who should lay down their arms within a week; those so surrendering should have their choice between emigration, with compensation for their property, or remaining, under guarantee of known Rom. Catholics, who should be their sureties. Those not giving themselves up on these terms were to be pursued without pity. By skilful dispositions of his troops he made ready to execute this threat summarily. Cavalier and the most intelligent chiefs of the rebels entered into negotiations with Villars, demanding the free exercise of their religion and the liberation of those adherents of it who had been condemned to the galleys. Villars declared that the king would never consent to the former, but promised the latter. He offered also to form those who should surrender into a regiment for the defense of France, and offered the colonelcy of it to Cavalier, who accepted. But other chiefs accused Cavalier of treachery; he could bring with him but a hundred men. He was sent to Alsace with these, but, conceiving a distrust of the government, went over to the enemy and took service in the army of the Allies.

Meantime the rest of the C., returning to the mountains, resumed the war, under the command of two chiefs, Ravel and Roland. Villars pushed the campaign against them vigorously, defeated and captured Ravel, who was executed next year (1705) at Nîmes. Roland was betrayed and executed 1704. Villars and his successor Berwick succeeded in entirely crushing the revolt. The peasants were disarmed, and the district pacified by certain exemptions from taxation, as compensation for property destroyed.—Frosterus, *Les insurgés protestants sous Louis XIV.* (Paris, 1868); C. V. Noorden, *Spanische Erbfolgekrieg*, I. II. (Düsseldorf, 1870, 1874).

CAMLET—CAMOENS.

CAMLET, n. *kām'let* [F. *camelot*—said to be from L. *camēlus*, a camel: mid. L. *camelōtum*, cloth of camel's hair: by some, traced to Arab. *'chamal*, fine]: a light and fine texture first made of camel's or goat's hair, now of wool or goat's hair, with silk—of a wavy or watered surface. British camlets are either wholly of wool, or of wool with cotton or linen. **CAM'LETED**, a. wavy like camlet; veined.

CAMMAS, n. or **CAMAS**, *kām'mas*, or **QUAMASH**, *quarom'-āsh*: an esculent plant, *Camassia esculenta*, of n.w. America, the bulbs of which are eaten by the natives.

CAMMERHOFF, *kām'mēr-hof*, **JOHN FREDERIC**: 1721, July 28—1751, Apr. 28; b. near Magdeburg in Saxon Prussia: Moravian bishop. He emigrated 1746 to Bethlehem, Penn., as assistant to the presiding bp. of the Moravian Church, and was active in mission work among the Indians, especially the Delawares and the Six Nations. The Oneidas adopted him 1748 as a member of their tribe. He spent four weeks in journeying, by canoe on the Susquehanna, and through the forests, to an Iroquois council at Onondaga, N. Y., 1750: the hardships of this trip destroyed his health. He died at Bethlehem.

CAMMOCK, n. *kām'mōk* [AS. *cammoc*]: the plant rest-harrow—so called from the length and toughness of its roots, by which the harrow is arrested; the *Onōnis arven'sis*, ord. *Leguminosæ*.

CAMOENS, *kām'o-ēns*, **LUIS DE** (modern spelling, *Camões*): abt 1524—79; b. Lisbon: the epic poet of Portugal. He studied the ancient classics at Coimbra. On his return to Lisbon, he fell in love with a lady of honor, Catharina d'Atayada—the beginning of all the poet's misfortunes. Having been banished by royal authority to Santarem, C. joined the expedition of John III. against Morocco, and lost his right eye in a naval engagement with the Moors in the Strait of Gibraltar. On his return to Lisbon, his bravery as a soldier was no more honored than his genius as a poet. Disappointed in all his hopes, he determined to leave forever his native land, and sailed for India, 1553. Offended by certain abuses of the Portuguese authorities in India, C. ventured to expose them in a satire, entitled *Disparates na India*, 'Follies in India,' in which he treated even the viceroy with ridicule. For this offense the poet was banished, 1556, to Macao, where he lived several years, and was engaged in writing *Os Lusíadas*. Here C. held the unpoetical but probably lucrative post of administrator of the effects of deceased persons; and having saved, as he thought, a competency for his future life, was recalled from his banishment, 1561. Unhappily, in returning to Goa, he suffered shipwreck, and lost all his property, excepting his epic poem. After other wanderings and misfortunes, C. took ship for Lisbon, where he arrived 1569, with no other wealth but his epic. He dedicated *The Lusiad* to the young king, Sebastian, who was very gracious; but, nevertheless, all the real patronage bestowed on C. consisted of a very small pension (about \$20), and permission to remain at the court of Lisbon.

CAMOGLIA—CAMORRA.

Even this small pittance was taken away after the death of Sebastian, and C. was left in such poverty, that a faithful Indian servant begged in the streets of Lisbon for the support of the great epic poet of Portugal. C.'s lyric poems written during this time of destitution contain many pathetic lamentations. He died obscurely in the hospital at Lisbon; and 16 years afterward, when it was proposed to erect a splendid monument to his memory, there was some difficulty in finding his burial-place.

The Lusiad (*Os Lusíadas*, 'the Lusitanians') celebrates the chief events in the history of Portugal, and is remarkable as the only modern epic poem pervaded by anything like the true national and popular spirit of the ancient epics. It is a gallery of epic pictures, in which all the great achievements of Portuguese heroism are represented. Among the most famous passages are the tragical story of Inez de Castro, and the apparition of the giant Adamastor, who appears as the Spirit of the Storm to Vasco da Gama, when crossing the Cape. The versification of *The Lusiad* is extremely charming. Patriotic sentiments pervade the work. Besides his epic poem, C. wrote sonnets, odes, elegies, eclogues, epigrams, satires, epistles, and three comedies—*Os Amphitryões* (after Plautus), *King Seleucus*, and *Filodemo*. There have been many editions of his works, one of the fullest being by the Viscount de Juromenha, with a good biography (6 vols., Lisb. 1869). Translations of the *Lusiad* have been made into almost all European languages. Mickle's English translation was published 1776; Captain Burton's excellent one (1881) was the ninth English rendering.

CAMOGLIA, *ká-mōl'yá*: town of n. Italy, on the Gulf of Genoa, about 13 m. e.s.e. of the city of Genoa. The chief occupation is fishing. Pop. above 5,000.

CAMOMILE, n: see CHAMOMILE.

CAMORRA, *ka-mōr'rá*: a secret society, existing through all parts of the former kingdom of Naples, the members of which are called *Camorristi*, and have exercised lawless force to a great extent over the humbler classes of society. Under the Bourbons, they openly presented themselves at markets, hackney-coach stations, public spectacles, and all occasions of popular amusement; assumed the right of deciding disputes; extorted a portion of whatever money passed from hand to hand for purchases, rents, wages, and the like, or in games; undertook also the transport of smuggled goods, and contracted for the commission of serious crimes. Their readiness for violence and murder, and their close association among themselves, made them so much dreaded, that *Camorristi* who had even been thrown into prison succeeded in exacting money from their fellow-prisoners, and from the jailer himself. The society has a central rendezvous in every large provincial town, and twelve such in the city of Naples. Those who belong to each of these sections of the society are under the absolute government of a chief elected by themselves, with whom is associated a treasurer. The latter

CAMOUFLET.

has the charge of the common fund into which all the Camorristi of that section pay their whole gains, for equal distribution among all their associates. Candidates for membership must show that they have neither been guilty of espionage nor theft; also that neither their wives nor their sisters are prostitutes; and must swear upon an iron crucifix a fearful oath of fidelity and secrecy. The candidate remains for a year, with the designation of *Picciotto d'onore*, as a pupil under an old Camorrista; and having completed his probation, and given proof of his courage and obedience in circumstances involving danger of life, he is advanced to the rank of a *Picciotto di sgarro*. Finally, after a longer period, and when he has given proof of his fitness on a number of occasions, he is admitted to full membership of the society as a *Camorrista*. Each Camorrista carries two knives of peculiar form, by which the members of the society recognize each other. They are held under the strictest discipline. Disobedience is punished by flogging, suspension from employment, or expulsion; treachery, even on the part of a member who has been expelled, is punished with death. If two Camorristi quarrel, their chief decides the question between them; but in difficult cases, a duel with daggers is the mode of decision. Under King Ferdinand II. the Camorra was tolerated for political reasons. The government of Francis II. endeavored to put down the society, and the police received instructions to seize and transport all known members of it. Those who remained entered into alliance with the Garibaldi committee, and rendered essential service in the expulsion of the Bourbons. An attempt was then made to employ them in the police service, but completely failed. The Camorra having fallen out with the new government, the members of the society now chiefly live by robbery in s. Italy.—See Monnier, *La Camorra, Notizie Storiche* (Flor. 1863).

CAMOUFLET, n. *kām'ô-flā* [F. *camouflet*, smoke of lighted paper]: in *mil.*, a small subterranean countermine containing usually abt. 10 lbs. of powder made for the purpose of blowing in the enemy's mining galleries and destroying the miners, or cutting off their retreat.

CAMP.

CAMP, n. *kämp* [F. *camp*—from L. *campus*, a plain; It. *campo*; Sw. *kamp*; Ger. *kampf*, battle]; the ground occupied by an army at rest, and the tents as arranged on this ground; in *OE.*, a fight; a battle: V. to rest an army in the open country (see **ENCAMP**): **CAMP'ING**, imp.: **ADJ.** fit or suited for a camp. **CAMPED**, pp. *kämpt*. **CAMP-CEILING**, a ceiling in which the marginal portion is sloping, following the line of the rafters, while the mid-portion is level. **CAMP-FIGHT**, the decision of any dispute by combat; a trial by arms. **CAMP-FOLLOWER**, n. one who follows an army but has not an appointment (see **CAMP FOLLOWERS**). **CAMP-MILL**, a mill adapted for the use of an army, to grind grain on the march, or in camp. It is carried on a wagon or running-gears, and is sometimes driven by the wheels in travelling; sometimes by a sweep operated by horses or men after the wheels are anchored or sunk in the ground. **CAMP STOOL**, a chair whose frame folds up into small compass for convenience of packing or carriage.

CAMP: ground occupied by an army at rest, and the tents, etc., arranged on it. The signification of this word in English is rather that which belonged to the Latin *castrum*, an encampment, or *castra*, a collection of tents, huts, and other structures, for the accommodation and protection of troops, than that which its etymology would more directly indicate. The regular system of encampment ultimately adopted by the Romans was adopted by degrees. The most complete account of it is furnished by Polybius, for an illustration of whose description see a plan in Dr. Smith's *Dictionary of Greek and Roman Antiquities*. When a Roman army was about to encamp, a tribune and several centurions were sent on before, to select a suitable site for the purpose. As soon as the locality was determined, they chose the spot for the pretorium or general's tent, and marked it with a white flag. Around the pretorium, as a sort of centre or heart to the whole system, the rest of the C. was laid out. It was generally placed on an elevated position, in order that the general might have the rest of the encampment under his eye, and be able to transmit his orders with greater facility. Polybius himself tells us, that the best conception which can be formed of a Roman C. of the more permanent kind is by regarding it as a military town: it probably had some resemblance to such modern camps as the English Aldershot (q.v.). The streets were broader than those usual in towns, the wider ones measuring 100, the narrower 50 ft.; and the *forum*, as its name indicates, was a sort of public market-place. A space of 200 ft. was left vacant all round between the tents and the ramparts, partly to afford space for the arrangements of the army, and for stowing away any booty that might be captured, but chiefly to protect the soldiers' huts from incendiary attempts from without. In form, the Roman C. was square, except in the case in which it was intended to embrace within its ramparts four legions, or two consular armies, when it became an oblong rectangle. The C. was surrounded by a fosse or trench (*fossa*), generally 9 ft. deep and 12 broad. On the top of the rampart of earth there

were stakes. The labor of constructing the rampart and the fosse was divided between the allies and the Roman legions, the former making the sides along which they were stationed, and the legions the rest. The task of superintending the construction of the C. among the Romans was intrusted to the tribunes; among the allies, to the prefects. Before the arrival of the troops, the different parts of the C. were so distinctly marked out and measured off, that they at once proceeded to their respective stations, as if they had entered a well-known city, and were marching to their quarters. The discipline of the C. was of the strictest kind. The tribunes administered an oath against theft both to freemen and slaves, and two maniples were chosen to keep the *via principalis*, which was a place of general resort, clean and in good repair. The other occupations connected with the C. were portioned out in like manner; and the superintendence of the whole was intrusted to two tribunes chosen by lot from each legion, and appointed to serve for two months. The prefects of the allies had a similar authority, which, however, seems to have been limited to their own troops. Every morning at daybreak the centurions and horsemen presented themselves to the tribunes, and these, in their turn, received their orders from the consul. The watchword for the night, marked on a four-cornered piece of wood, was given out with much formality. The night was divided into four watches, each of three hours' length; and there was an arrangement for ascertaining that guard was kept with vigilance. The soldiers of the watch companies received from the tribune a number of small tablets, with certain marks upon them, and these tablets were collected during the night by the horsemen whose duty it was to visit the posts, from such of the guards as they found on duty. Where these inspectors found the guards asleep or absent, they called upon the bystanders to witness the fact, and then passed on to the next. In the morning, the inspectors appeared before the tribunes, and gave up the tablets which they had received, when the guards whose tablets were not produced were required to account for them. A regular scale of rewards and punishments was established in the camp. In comparing the encampments of the Romans with those of his own countrymen, Polybius tells us that the Greeks trusted mainly to a judicious selection of their ground, and regarded the natural advantages which they thus secured as supplying in a great measure the place of artificial means of defense. The Greeks, consequently, had no regular form of C., and no fixed places were assigned to the different divisions of the army. When the practice of drawing up the Roman army according to cohorts, introduced by Marius and Cæsar, was adopted, the internal arrangements of the C. experienced a corresponding change. Latterly, even the square form was abandoned, and the C. was made to suit the nature of the ground. It was always held important, however, that the C. occupied a defensible position; that it could not be inspected from a neighboring height; and that it had a command of water.



Camomile (*Anthemis nobilis*).



Campanile, Palace of the Scaligeri, Verona.

CAMPAGNA—CAMPAGNA DI ROMA.

When stationary camps (*castra stativa*) came into more general use, several parts appeared, not mentioned by Polybius, for instance, the infirmary (*valetudinarium*), the farriery (*veterinarium*), the forge (*fabrica*), etc., and as a great variety of troops then came to be employed, they must have had new stations appointed to them in the camp. Many of the stationary camps ultimately became towns, and to this is ascribed the origin of most of the towns in England the names of which end in *cester* or *chester*. Among the most perfect of those which retained the form of the simple encampment, is that at Ardoch in Strathern, Perthshire, in the grass-covered mounds and ridges of which most of the divisions of the C. have been distinctly traced by antiquaries. See General Roy's *Military Antiquities in Great Britain*, and the *Caledonia Romana* of the late Robert Stuart.

It is believed that, during the middle ages, the plan adopted by the Romans in their camps was more or less adhered to, seeing that the weapons employed, which mainly determined the character of the troops, were nearly the same. In Britain before the arrival of the Romans, also during the Saxon and Danish periods, the camps, usually circular in form, appear to have been somewhat rude, with the cavalry grouped round the standard in the centre, and the infantry placed near the front.

The principles of castrametation, or camp-formation, underwent much change after the invention of gunpowder, owing to the necessity for defending the C. from artillery. For modern camps, of different kinds, see ENCAMPMENT.

CAMPAGNA, *kám-pân'yá*: town of Italy, province of Salerno, between high mountains, about 20 m. e. of Salerno. It has a fine cathedral, several convents, and a large annual fair. Pop. 7,000.

CAMPAGNA DI ROMA, *dē rō'mâ*: undulating, uncultivated, and unhealthful plain of Italy surrounding Rome, including the greatest part of ancient *Latium*, and forming the late papal delegation of Frosinone and a great part of the Comarca di Roma. Its length is variously stated, arising from measurements from different points. But supposing the name to apply to the district extending from Cape Linaro, s. of Civita Vecchia, to Terracina, beyond the Pontine marshes, its length is about 90 m.; and its breadth inland, to the Alban and Sabine hills, is stated as 27-40 m. A broad strip of sandy plain skirts the Mediterranean. The ground, nowhere more than 200 ft. above the sea, is almost entirely volcanic, and the lakes are formed by craters of extinct volcanoes. The vapors rising from this district, and especially from the Solfatara (q.v.), produce the pestilential atmosphere styled *Aria Cattiva*. The number of inhabitants is very small, and in summer they are driven from the C. by its pestilent air, and seek shelter in Rome and neighboring places. In autumn, herdsmen descend from the Apennines to the C. with their herds, the pasturage in some parts being rich and abundant. This district was not always uncultivated and depopulated as

CAMPAGNOL—CAMPANA.

we now find it, for Domitian and Hadrian built here their splendid villas. Wars and devastations, the 'black-death' (q.v.) in the 14th c., which greatly thinned the population, and inundations from the Tiber, have been the main causes of the present state of the C.; but, according to Livy, it was always unhealthful, even when well cultivated. Some of the popes, especially Pius VI., have endeavored to drain the Pontine Marshes, and, during the dominion of the French in Italy, General Miollis made great improvements in drainage, timber-planting, and cultivation in the Campagna.

CAMPAGNOL, n. *kām-pan'yōl*: a small species of mouse, called also the Meadow-mouse, *Arvicola arvalis* or *agrestis*, which is very destructive to roots and seeds in fields and gardens.

CAMPAIGN, n. *kām-pān'* [F. *campagne*; OF. *campaigne*, an open field, country—from mid. L. *campāniā*, a plain. It. *campagna*, the plain open field]: an extensive tract of country not hilly; the time an army is engaged either in marching, fighting, or in camp. CAMPAIGN'ING, n. serving in a campaign. CAMPAIGN'ER, n. one who. Campaign generally means a connected series of military operations, forming a distinct stage or step in a war. Under the old system of warfare, when armies kept the field only in summer, a C. was understood to include all that was done by an army from the time it took the field till it went again into winter-quarters. Now that winter is no longer allowed to arrest military operations, it is more difficult to say where one C. ends and another begins. Some writers make a C. include all the steps taken to accomplish some one immediate object.

CAMPAN, *kōng-pōng'*, JEANNE LOUISE HENRIETTE: 1752, Oct. 6—1822, May 16; b. Paris: reader to the daughters of Louis XV. She was favored by Marie Antoinette, and gave her royal patroness numerous proofs of fidelity. When the unfortunate queen was conveyed to the Temple, she wished to share her captivity, but was refused entrance by Petion. During the Reign of Terror she remained concealed at Combertin. After the fall of Robespierre, she opened a boarding-school at St. Germain-en-Laye, which was patronized by Josephine Beauharnais, who sent her daughter Hortense to it. In 1806, Napoleon appointed her lady-supt. of the Institution at Ecouen for the education of the daughters of the officers of the Legion of Honor. After the restoration, this institution was suppressed, and Madame C. retired to Mantes, where she died. She is remembered chiefly for her interesting works—*Mémoires sur la Vie Privée de la Reine Marie Antoinette* (4 vols., 5th ed., Par. 1824), *Journal Anecdotique* (Par. 1824), and *Correspondance Inédite avec la Reine Hortense* (2 vols., Par. 1835)—giving recollections of the court of Louis XV., of Marie Antoinette, the Revolution, and some traits from the private character of Napoleon.

CAMPANA, LA, *lā kām-pā'nā*: town of Andalusia, Spain, on the Madre-Vieja, tributary of the Guadalquivir.

CAMPANARIO—CAMPANHA.

about 37 m. e.n.e. of Seville. The people are engaged chiefly in agriculture, and in weaving and brick-making. Pop. 4,380.

CAMPANARIO, *kám-pá-ná'rē-o*: town of Estremadura, Spain, about 62 m. e.s.e. of Badajos; an ill-built place, with narrow, uncared-for streets. It has manufactures of linens and ropes, and a trade in the agricultural produce of the neighborhood. Pop. 6,400.

CAMPANELLA, *kám-pâ-ně'l'lá*, TOMMA'SO: 1568-1639; b. Stilo, in Calabria: Dominican monk and philosopher. He studied at Naples and Cosenza. The writings of Telesius first awakened his doubts respecting that pile of artificial dogmas styled the 'scholastic philosophy.' The results of his studies were given in his *Philosophia Sensibus Demonstrata*, etc. (Naples, 1591), which contained a defense of Telesius. His superiority in disputations exposed him to the hatred and false accusations of the monks and schoolmen; he was compelled to flee from Naples to Rome, thence to Florence, Venice, and Bologna. Afterward he returned to Calabria, but having involved himself in a political conspiracy, he was seized and confined in a Neapolitan dungeon for 27 years; tried five times, and tortured seven; accused of heresy; and declared the author of a book which had been published 30 years before he was born. In 1626, Pope Urban VIII. had him brought to the prison of the Inquisition at Rome, but immediately liberated him, and treated him in a very generous manner. After being again persecuted by the Spanish government, C., who had formed the friendship of the French ambassador at Rome, the Duc de Noailles, obtained a letter of introduction to Cardinal Richelieu, and secretly left for France, where he was graciously received. He died in the Dominican monastery of St. Honoré, near Paris. Most of his works—*De Gentilismo non Retinendo* (Paris, 1636), *Astrologicorum Libri VII.* (Lyon, 1629), *Prodromus Philosophiæ Instaurandæ* (Frankfort, 1617), *Exordium Metaphysicæ Novæ*, *De Sensu Rerum et Magia* (Frankfort, 1620)—were written during his imprisonment. His philosophical views give expression to that confused fermentation of new ideas characteristic of the close of the 16th and opening of the 17th c.—bold and clear opinions strangely mingled with commonplaces and with astrological dreams and fancies. The patronage of the pope was gained, not by C.'s speculative works, but by several writings in defense of the Rom. Cath. Church. His *De Monarchia Hispanica Discursus* is a work of great power and value, comprising a sketch of the political world of his time, with special reference to Spain. It was translated into English during Cromwell's protectorate.

CAMPANHA, *kám-pân'yá*: town of Brazil, about 150 m. n.w. of Rio de Janeiro, surrounded by bare hills, much cut up by gold mines. The houses are built chiefly of earth, and surrounded by gardens. C. has several churches, a Latin school, hospital, theatre, etc. Pop. 6,000.

CAMPANIA—CAMPANILE.

CAMPANIA, *kām-pān'yā*: anciently a province of central Italy, having Capua as its capital (now subdivided into the provinces of Benevento, Naples, Salerno, Avellino, and Caserta); was bounded on the s. by Lucania, e. by Samnium, n. by Latium, and w. by the Tyrrhenian Sea. It was one of the most productive plains in the world, producing in extraordinary abundance corn, wine, and oil; and both by Greek and by Roman writers is celebrated for its soft and genial climate, its landscapes, and its harbors. It was the *regio felix* of the Romans, who built here many of their most splendid villas, etc. Through it passed the Appian Way, greatest high-road of Italy. The promontory Misenum, Mount Vesuvius, the river Volturnus, the towns Baiæ, Cumæ, Linternum, Puteoli, Naples, Herculaneum, Pompeii, Nola, Salernum, Capua, etc., belonged to Campania. It was the oldest Greek settlement in Italy, having been colonized, according to the later chronologers, about B.C. 1050; but this date is probably too early. It was next conquered by the Etruscans, and several of the towns above mentioned, such as Capua and Nola, were founded by that people. The Etruscans then succumbed to the more warlike and hardy Samnites, who, in their turn, yielded to the irresistible valor of Rome (B.C. 340). Through all these vicissitudes of conquest the substratum of the people remained as at the beginning. The mass of the Campanians were essentially of Oscan race, and Oscan they remained. Indeed, it is mainly from them that our knowledge of the Oscan language is derived, and one of their towns—Atella, between Capua and Naples—had the honor of introducing upon the early Roman stage a species of popular drama or comedy, greatly relished for its quaint and vigorous humor: see **ATELLANÆ**.

CAMPANIFORM, *kām-pān'ī-fawrm*, or **CAMPANIL'IFORM**, *-īl'ī-fawrm*, a.: bell-shaped; an epithet applied to flowers which resemble a bell in shape.

CAMPANILE, n. *kām'pā-nīl* or *kām'pā-nē'lā* [It. *campanile*, a campanile—from mid. L. *campāna*, a bell]: bell-tower of the larger kind, usually detached from the church. Scarcely any of the existing bell-towers of England and the United States answer to the Italian conception of the C., but it is said that there was a very fine one at Salisbury, England, 200 ft. in height, destroyed by Wyatt. In Italy they are very numerous: perhaps the most remarkable are the so-called 'leaning tower' of Pisa, and the C. of Florence. The former, circular in form, is decorated with columns and arcades to the summit of its eight stories, and presents a very imposing appearance, reminding the traveller of the Coliseum at Rome, from which, and the now destroyed Septizonium, the idea of it is said to have been taken by the architects Bonano of Pisa, and Wilhelm of Innsbruck. But though less curious, the famous C. of Giotto is perhaps even more worthy of note. It was erected, 1334, with the express object of surpassing, both in height and in richness of workmanship, any of the remains of antiquity. In form it is a paral-

CAMPANOLOGY—CAMPANULA.

leopiped, and is of the same dimensions from bottom to top. Though it is very lofty—267 ft.—it consists of only four stories, of which the tallest are the uppermost and undermost; and the windows in the upper story are rather larger than those in the two beneath, the object being to counteract the diminution to the eye occasioned by the greater distance. The original design of Giotto was that a spire of 100 braccia in height should surmount the present structure, and on the summit may be seen the four great piers whence it was to have risen. The splendid C. of Florence, in its present condition, must thus be regarded as only a fragment. (There is a fine C. at Seville, 350 ft. in height, built by Guever the Moor, 1568. It is called La Giralda, from a brazen figure, which, though it weighs a ton and a half, turns with the wind.) The famous C. of St. Mark's, Venice, 325 ft. high, erected 888 A. D., fell to the ground 1902, July 14, crushing with it the Sausovine Loggia. The municipal authorities at once took steps for its restoration.

CAMPANOLOGY, n. *kām'pă-nōl'ō-jī* [mid. L. *campāna*, a bell: Gr. *logos*, a discourse]: the art of ringing bells, or a treatise on the art. **CAMPANOL'OGIST**, n. *-ō-jīst*, one skilled in the art of ringing bells; a writer on.

CAMPANULA, n. *kām-păn'ū-lă* [mid. L. *campan'ŭlă*, a little bell—from *campāna*, a bell: It. *campanella*]: a genus of plants bearing bell-shaped flowers; the bell-flower. **CAMPAN'ULATE**, a. *-ū-lăt*, in *bot.*, bell-shaped, as the *harebell*.

CAMPANULA: genus of plants of the nat. ord. *Campanulaceæ* (q.v.), distinguished by a bell-shaped corolla



Harebell (*Campanula rotundifolia*).

with five broad short segments, filaments dilated at the

CAMPANULACEÆ—CAMPBELL.

base, a 2-5-cleft stigma, and a top-shaped capsule with 2-5 cells, opening by lateral clefts below the calyx segments. The species are very numerous, abounding chiefly but not exclusively in the northern parts of the world, and the more elevated districts of the temperate zones. They are mostly herbaceous, some of them annual. The name BELL FLOWER, common to many of them, is often extended to all. The flowers are in general beautiful, and many species are frequent ornaments of flower-borders. One of the most common and beautiful is the HAREBELL (q.v.) or BLUEBELL (*C. rotundifolia*). The CANTERBURY BELL (*C. Medium*) is a beautiful annual, also very common; native of the central parts of Europe.—Medicinal virtues were formerly ascribed to some species, particularly in affections of the throat, wherefore *C. Trachelium*, frequent in woods in England, has received the name of Throatwort; but they are now regarded as inert.—The roots of some are reckoned among esculents, as those of the RAMPION (q.v.), (*C. Rapunculus*), cultivated in some parts of continental Europe.

CAMPANULACEÆ, *kăm-păn-ũ-lă'sē-ē*: nat. ord. of exogenous plants, herbaceous or half shrubby, with a bitter milky juice; leaves without stipules, and generally alternate; the calyx usually 5-lobed, its tube adhering to the ovary; the corolla monopetalous, inserted into the top of the calyx, usually 5-lobed and regular; the stamens inserted into the calyx, and alternate with the lobes of the corolla; the fruit with two or more many-seeded cells, crowned with the withered calyx and corolla, and opening by division of the cells (*loculicidally*); the seeds fixed to the axis, and having fleshy albumen. About 500 species are known, natives chiefly of the temperate and colder climates of the n. hemisphere, where their blue or white flowers are among the finest ornaments of fields and woods. The roots and young leaves of some species are eatable, as is the half-fleshy fruit of *Canarina Campanula*, native of the Canary Islands.

CAMPBELL, *kăm'el* or *kăm'bel*: family name of the Lords of Argyle. The origin of the family has not been ascertained. One theory makes it of Anglo-Norman origin; another traces its descent through a long line of Celtic chiefs to King Arthur. It first appears in record toward the end of the 13th c., when it held lands in Ayrshire and Argyle. For the chiefs of the family that have been most distinguished in public affairs, see ARGYLE.

CAMPBELL, *kăm'el* or *kăm'bel*, ALEXANDER, D.D.: 1786, June—1866, Mar. 4: founder of the 'Disciples of Christ,' popularly known as 'Christians' or 'Campbellites;' b. co. Antrim, Ireland; son of a Presb. minister, who was a relative and namesake of Thomas Campbell the poet. He was educated at the Univ. of Glasgow, followed his father to America, 1809, and preached in Washington co., Penn., near Bethany, Va., his later residence. He and his father formed an independent society at Brush Run, Penn., 1810. C. adopted Baptist views and usages, 1812,

CAMPBELL.

but still objected to human creeds, regarding the Bible as a sufficient rule of faith. Excluded from Baptist communion, C. and his followers organized, 1827. He began, 1823, to publish the *Christian Baptist*, changed, 1829, to the *Millennial Harbinger*. He founded Bethany College, 1840, and held its presidency till his death. Before that event his sect had 350,000 members, chiefly in Va., Ky., and Tenn.; it has since spread in the n.w. states. See DISCIPLES. C. published sundry debates, hymn-books, theological works, and a translation of the New Testament, in all 52 vols. He had 'an acute, vigorous mind, quick perceptions, and rapid powers of combination.' He died Bethany, W. Va. His life was written by R. Richardson, 2 vols., 1868.

CAMPBELL, Sir COLIN, Lord CLYDE: 1792-1863, Aug.; b. Glasgow: distinguished British general. His father was a cabinet-maker, named John Macliver, but Colin assumed the name of C., to gratify an uncle on the mother's side. He entered the army as an ensign, 1808; fought through the war in the Spanish peninsula with distinction, and took part in the expedition to the United States, 1814. In 1842 he attained the rank of col., and in the same year he was in the attack on Chusan, in China. He next served in the Punjab, commanding the left at the battle of Chillianwallah, and receiving for his conduct the highest praise. He next commanded in the Peshawur district with uniform success against the hill-tribes. On the breaking out of the Crimean war, 1854, he was appointed to command the Highland Brigade, and was prominent in the battle of the Alma; and afterward at Balaklava, where, with the 93d Highlanders, which he did not even form into square, he beat back the Russian cavalry, who were swooping down on the port, with its accumulation of shipping and stores. His services in this war were rewarded with promotion to the rank of maj.gen., and he was also created a knight grand cross of the Order of the Bath, and received the cross of the French Legion of Honor. He was appointed inspector-gen. of infantry, and, 1857, commander of the forces in India, then engaged in quelling the Indian mutiny, which by his energy and judgment was soon utterly subdued. A notable characteristic of C.'s generalship was his care for the lives of his men, all his victories being won with the minimum expenditure of the blood of his soldiers. In 1858 C. was created a peer, with the title of Baron Clyde, and appointed a general, the East India Company granting him an annuity of £2,000. C. arrived in Britain from India, 1860. See his *Life* by Shadwell (1881).

CAMPBELL, GEORGE, D.D.: 1719-1796, Apr. 6; b. Aberdeen, Scotland: Presb. theologian. He was educated for the law, but turned to the study of divinity. In 1746 he was ordained minister of Banchory Ternan a parish some m. s.w. of Aberdeen; and in 1759 he was appointed principal of Marischal College. His first work was his famous *Treatise on Miracles*, in answer to Hume, speedily translated into French, Dutch, and German; exceedingly

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acute and valuable as the dispute then stood; though not fitted to the changed line of attack on miracles in the present generation. In 1771, C. was elected prof. of divinity in Marischal College. In 1776, he published his *Philosophy of Rhetoric*, still a standard work; and later, a *Translation of the Gospels, with Preliminary Dissertations and Notes*. After his death appeared his *Lectures on Ecclesiastical History*.

CAMPBELL, JOHN (CAMPBELL), Lord, High Chancellor of England: 1779-1861, June; b. in the co. of Fife, Scotland; son of a minister of Cupar. He was intended for his father's profession, and was sent, while a mere boy, to the neighboring Univ. of St. Andrews. C. himself had no inclination for a clerical life, and when he had completed his studies in the faculty of arts, he left for London, being then about 19 years of age. He obtained employment on the staff of the *Morning Chronicle*, where, in due time, he was intrusted with the care of the theatrical criticism and the reports in the house of commons. He was called to the bar 1806. His sound sense, unpretending activity, and devotion to business were rewarded with an extensive common-law practice, and, after a time, with professional promotion. The silk-gown of a king's counsel was conferred upon him 1827. Three years afterward, he entered parliament, actuated, he writes in the preface to one of his works, by a desire to obtain for England the benefits of a national registry of titles to land. The effort at the time was unavailing, as the landlords, whom it was aimed immediately to benefit, completely misunderstood the purport of the project. C. was promoted by the whig party, to which he had attached himself, to the solicitor-generalship 1832, and to the attorney-generalship 1834. In the same year he was chosen to parliament for Edinburgh, and continued till 1841, remaining in the office of attorney-gen. during nearly all that period. In 1841, he was made chancellor of Ireland and a peer of the United Kingdom; but held the office of chancellor only a few months, while the Melbourne cabinet were in office. For the first time since boyhood, he found himself without regular daily labor, and at the mature age of 60, set to work to win the literary fame which he professes always to have secretly coveted. His first publication was a collection of his speeches at the bar and in the house of commons. For three or four years after the publication of his speeches, C. was engaged in the preparation of the *Lives of the Chancellors*, the first series of which appeared 1845. In 1846, he joined the Russell cabinet in the capacity of chancellor of the duchy of Lancaster. His ministerial duties were not sufficiently arduous to interrupt his literary labors, and he proceeded to complete the *Lives of the Chancellors*, and to publish a supplemental series of *Lives of the Chief-Justices of England*. Both works have had great popularity, but leave no doubt that the author was more fitted for a practical lawyer than for a man of letters. C. was appointed chief-justice 1850. He held the office for nine years, at the end of which time he

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received the highest honor of his profession, being made high chancellor. See his *Life* (with autobiography and letters), edited by his daughter (1881).

CAMPBELL, THOMAS: English poet: 1777, July 27-1844; b. Glasgow; youngest of ten children of a merchant. He was sent to the university of his native city, and was distinguished for knowledge of Greek literature. On leaving the university, C. went to reside as a tutor for a year in the island of Mull. The grand and desolate scenery of the West Highlands made a deep impression on his mind, traceable in his verses. Returning from Argyleshire, C. went to Edinburgh to study law, but poetry had the strongest attraction, and he wrote *The Pleasures of Hope*. The poem was published 1799, and went through four editions in a year. After its publication C. went to the continent; and 1800, Dec. 3, witnessed from a Bavarian monastery the battle of Hohenlinden, between the French and Austrians. In 1801, he returned to England, with *The Exile of Erin* and *Ye Mariners of England* in his portmanteau; and shortly afterward took up his abode in Edinburgh, where *Locheil's Warning* was composed. In 1803, C. removed to London and adopted literature as a profession. He contributed articles to *The Edinburgh Encyclopædia*, and compiled *The Annals of Great Britain from the Accession of George II. to the Peace of Amiens*, 3 vols. In 1806, through the influence of Mr. Fox, C. received a pension of £200 per annum from government. In 1809, he published *Gertrude of Wyoming*, which bears the same relation to *The Pleasures of Hope* that *The Castle of Indolence* bears to *The Seasons*—less brilliant and striking, but more mature and finished. In 1818, C. was again in Germany, and on his return published his *Specimens of the British Poets*, 7 vols. In 1820, he delivered a course of lectures on poetry at the Surrey Institution. From this date to 1830, C. edited *The New Monthly Magazine*, and contributed thereto several poems, one of which, *The Last Man*, is in some respects the loftiest of all his performances. In 1824, he published *Theodoric and other Poems*. In 1827, he was elected lord rector of the Univ. of Glasgow, and received the unusual honor of re-election the two following years. He published *The Pilgrim of Glencoe and other Poems*, 1842. His later publications did not add to his fame. He died at Boulogne, and was buried in Westminster Abbey, Ma-caulay, Dean Milman, and other celebrated persons bearing the pall.

C. is an English classic. With the young, *The Pleasures of Hope* is a favorite; while readers of maturer years find a charm in the sylvan scenery and tender domestic scenes of *Gertrude*. It is in his lyrics, however, that C. is at his best: *Hohenlinden*, *Ye Mariners of England*, and *The Battle of the Baltic*, are not paralleled in the language. Their simplic-

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Campbell's Autograph.

ity and spirit both stir patriotic feeling and hold the memory.

CAMPBELL ISLAND—CAMPER.

CAMPBELL ISLAND: lonely spot on the s. Pacific, lat. $52^{\circ} 33'$ s., long. $169^{\circ} 9'$ e. Though it is mountainous, and measures only 36 m. around, it is valuable on account of its harbors. It is also scientifically interesting, being volcanic, and displaying a rich and rare flora.

CAMPBELLITES: see DISCIPLES OF CHRIST.

CAMPBELTON, *kām'el-tūn* or *kām'bel-tūn*: a royal burgh and seaport, on the e. coast of Scotland, near the s. end of the peninsula of Cantire, Argyleshire, and the most important town in that county; 65 m. w.s.w. of Glasgow, on a fine harbor or sea-loch, 2 m. long and 1 m. broad. It is noted for the number (20–30) of its whisky distilleries. It unites with Ayr, Inverary, Irvine, and Oban to return one member to parliament. A sculptured granite cross stands in the principal street, supposed to have been brought from Iona. Chief exports are whisky, herrings, and Highland cattle and sheep. In 1880, 937 vessels, of 86,390 tons, entered, and 920, of 85,748 tons, cleared the port. Pop. (1871) 6,680; (1881) 7,693; (1891) 8,235.

CAMPEACHY, *kām-pē'che* (Sp. CAMPECHE, *kām-pā'-chā*): province of Mexico, in the peninsula of Yucatan. It has a few small streams and lakes, a soil mainly sandy, some good pasture lands, and extensive forests. Rice, sugar, and salt are produced, and the fibres of the pita plant or *jenequea* (*agave Americana*) are prepared in large quantities. C. contains the ruins of Tekel and other cities. Area, 18,807 sq. m.; pop. (1900) 84,281.

CAMPEACHY (Sp. CAMPECHE): seaport on the w. side of the peninsula of Yucatan, which divides the Caribbean Sea from the Gulf of Mexico; lat. $19^{\circ} 50'$ n., long. $90^{\circ} 33'$ w. Though it has a shallow haven, yet it is the centre of the trade in logwood; it exports also cotton and wax. It is a handsome city, containing churches, convents, a cemetery, a theatre, a college, and ship-building docks. Pop. (1880) 12,600; (1892) 18,730.

CAMP-EQ'UIPAGE: the various movable articles required by soldiers in camp, such as tents, cooking utensils, spades, wagons, and the like; but applicable to the domestic rather than the warlike wants of the soldier. In the days when armor was worn, the camp-equipage was enormously heavy and complicated. In the present day, a certain amount of equipage is provided for a given number of troops: see ENCAMPMENT: TENT: etc.

CAMPER, *kām'pēr*, PETER: 1722, May 11—1789, Apr. 7; b. Leyden: physician and anatomist. He studied medicine at Leyden; in 1750, he became prof. of medicine at Franeker; 1755, at Amsterdam; and 1765, at Groningen. In 1773, he resigned his post, resided some time at Franeker, and then travelled. On being elected a member of the state council, 1787, he removed to the Hague, where he died. C. was distinguished not only for the services he rendered to anatomy, surgery, obstetrics, and medical jurisprudence, but also as a promoter of the fine arts. He was remarkably skilful in pen-and-ink drawing, painted

CAMPERDOWN—CAMPHENE.

in oil, embossed, and even acquired considerable experience as a sculptor. For his observations on the facial angle, see **ANGLE**. His work on the connection of anatomy with the art of drawing was an important contribution to the theory of art. Another work, *Description Anatomique d'un Eléphant Mâle*, edited by his son, G. A. Camper, Paris 1802, is worthy of notice. C.'s collected writings, with plates, appeared under the title, *Œuvres qui ont pour Objet l'Histoire Naturelle, la Physiologie et l'Anatomie comparée*, 3 vols. (Par. 1803).

CAMPERDOWN': broad tract of low downs which separates the small hamlet of Camp, in n. Holland, from the German Ocean; about 30 m. n. from Haarlem. It is notable for the victory obtained, off that part of the coast, by Admiral Duncan over the Dutch fleet, 1797, Oct. 11. The Dutch fleet under Admiral van Winter had stolen out of the Texel, with the view of joining the French fleet at Brest, when it was intercepted by Admiral Duncan, and after an obstinate battle, attended with great loss on both sides, the Dutch admiral was compelled to yield, leaving 8 sail of the line and several smaller vessels in the hands of the English, himself becoming a prisoner.

CAMPESTRAL, a. *kăm-pēs'trāl* [L. *campest'ris*, pertaining to a level field]: relating to fields or growing in them.

CAMP-FOLLOWERS: sutlers and dealers in small-wares who follow an army. In India, owing to the peculiar habits and customs of the Hindus, and the large number of servants retained by English officers, the C. F. are in immense number: comprising servants, sutlers, cantiniers, hostlers, water-carriers, snake-charmers, dancers, conjurors, and women. In Feb. 1839, when a Bengal army of 15,000 men left Shikarpoor for Afghanistan, it was accompanied by no fewer than 85,000 C. F.: the commander took with him six weeks' food for the whole 100,000. All English commanders in India find this regulation very burdensome. Even in European armies, however, C. F. are regarded as necessary; they are under the control of the commanding officer, and are subject to the articles of war—not, however, in cantonments, only in the field. French armies are accompanied by women much more largely than English.

CAMPHENE, *kăm'fēn*, or **CAM'PHILENE**: artificial variety of camphor obtained from turpentine, by acting thereon with the dry vapor of hydrochloric acid, and keeping the whole at a low temperature by immersing the vessel in a freezing mixture. A solid substance is produced, which separates in white crystalline prisms, and has the taste and aromatic smell of common natural camphor. As prepared, it is strictly a hydrochlorate of C.; but the latter can be obtained free from hydrochloric acid, by passing the vapor of the compound substance over dry heated quicklime, when the acid is held by the lime, and pure C. passes over. It is not so similar to ordinary camphor when thus freed from the hydrochloric acid.

CAMPHENE—CAMPHOR.

CAMPHENE, n. *kām'fēn*, or **CAMPHINE**, n. *kām'fīn* [a probable contr. of CAMPHOGEN]: rectified oil of turpentine, obtained from the *Pinus australis* of the southern states; formerly much used for burning in lamps, of late it has largely given place to kerosene. It is very volatile, and burns very freely, giving off a pure white brilliant light; and when the vapor diffuses itself through air, it forms a dangerously explosive mixture.

CAMPHOGEN, n. *kām'fō-jēn* or *-jēn* [new L. *camphōrā*, camphor, and Gr. *gennāō*, I bring forth]: the product of the distillation of camphor with dry phosphoric acid.

CAMPHOR, n. *kām'fēr* [F. *camphre*—from Ar. *kafur*; Mal. *kaphur*; Sp. *canfor*; mid. L. *camphōrā*, camphor]: a whitish substance of an aromatic bitter taste and fragrant smell, much used in medicine. **CAM'PHORATE**, v. *-āt*, to saturate or tincture with camphor: **ADJ.** pertaining to camphor. **CAM'PHORA'TING**, imp. **CAM'PHORA'TED**, pp.: **ADJ.** impregnated with camphor. **CAMPHOR-TREE**, n. the tree producing camphor. **CAM'PHORA'CEOUS**, a. *-ā'shūs*, of or like camphor. **CAMPHOR'IC**, a. *-fōr'ik*, of or from camphor. **CAMPHIRE**, n. *kām'fīr*, OE. for **CAMPHOR**.

CAM'PHOR: a solid essential oil found in many plants, and separable from many essential oils. It abounds in certain species of the nat. ord. *Lauraceæ* (q.v.). Almost all the C. of commerce is the produce of the C. Laurel or C. tree (*Camphora officinarum*, formerly known as *Laurus Camphora*), native of China, Japan, Formosa, and Cochin-China, and which has been introduced into Java and the West Indies. The genus *Camphora* differs from *Cinnamomum* (see CINNAMON) chiefly in having a thin instead of a leathery calyx. The C. Laurel is a tree of considerable height, much branched, with lanceolate, evergreen leaves on short stalks, and small yellowish-white flowers in axillary and terminal panicles. The fruit is in size and appearance like an imperfectly ripened black currant. Every part of the tree, but especially the flower, smells strongly of camphor. The wood is light and durable, not liable to be injured by insects, and much valued for carpenter's work. In the extraction of C. from the *C. Laurel*, the wood of the stem and branches is chopped up into fragments, and introduced into a still with water, and heat applied, when the steam generated carries off the C. in vapor. These vapors rise, and in passing through rice-straw, with which the head of the still is filled, the C. solidifies, and is deposited round the straw in minute grains or particles, somewhat about the size of raw sugar or coarse sand. These grains of impure C. are detached, and being introduced into a large globular glass vessel in quantities of about 10 lbs., are reheated, when first the water rises in steam, and is allowed to escape at a small aperture; and thereafter, this aperture being closed, the C. sublimes and resolidifies in the interior upper part of the flask, as a semi-transparent cake, leaving all the impurities behind. The flasks are then cooled and broken by throwing cold water on them, and the C. taken out, and sent into

market. The glass globes employed are called by an Italian name, *bombolo*, the sublimation of C. having been practiced first in Venice.—C. was unknown to the Greeks and Romans, and was first brought to Europe by the Arabs. It is a white tough solid, slightly lighter than water, and floats thereon. It is very sparingly soluble in water, but freely soluble in alcohol, ether, acetic acid, and the essential oils. It fuses at 347° , and boils at 399° , and when set fire to, is very inflammable, and burns with a white smoky flame. Thrown upon water, it floats, and may be set fire to, when the currents generated alike from the solution in water and the irregular burning of the pieces, cause a curious rotatory motion. It has a peculiar hot aromatic taste, and an agreeable characteristic odor.

C. is used in medicine, both internally and externally, as a temporary stimulant. It is frequently employed in gout and rheumatism. In small doses, it acts as an anodyne and antispasmodic; in large doses, it is an irritant poison. It is generally reckoned an anaphrodisiac. Its alcoholic solution and liniments in which it is the principal ingredient, are much used for external application in sprains and bruises, chilblains, chronic rheumatism, and paralysis.—The effluvia of C. are very noxious to insects, and it is therefore much used for preserving specimens in natural history.

The BORNEO C. or SUMATRA C. of commerce, sometimes called HARD C., is the produce of *Dryobalanops aromatica*, a large tree of the nat. ord. *Dipteraceæ* (q.v.). The C. is obtained by cutting down the tree, and splitting it into small pieces; being found in crystalline masses in natural cavities of the wood. To this substance the Chinese ascribe extraordinary medicinal virtues, so that it is sold among them at more than fifty times the price of common camphor. It is seldom exported as an article of commerce.—The *Dryobalanops aromatica* yields also a pale-yellowish limpid fluid, which gushes out when deep incisions are made in the tree with an ax, and which is generally called LIQUID C. or C. OIL. It is sometimes imported into Europe. It has a smell somewhat resembling that of C., but more aromatic, like oil of cajuput. It is supposed to be from this fluid that the crystalline Hard C. is deposited. See BORNEENE.

CAMPHUYSEN, *kâmp'hoy-zên*, DIRK RAFAELSZ: 1586—1627, July 9: Dutch painter and poet; b. Gorcum. He studied under Goritz, and won early fame by small landscapes and figure-pieces, executed with delicacy and beauty uncommon in his school, but soon exchanged art for divinity. Espousing the tenets of Arminius, he was driven from his parish of Vleuten, suffered much persecution, and for a time wandered as a fugitive. C. wrote a *Compendium Doctrinæ Sociniorum* and other theological works, translated the Psalms into Dutch verse, and produced sundry lyrics which have won much praise and been often reprinted. He died at Dokkum.

CAMPI, *kâm'pê*: family of artists who founded at Cre-

CAMPIAN—CAMPION.

mona, in the middle and near the close of the 16th c., an eclectic school of painting, parallel with that founded by the family Caracci (q. v.).

GIULIO C., 1500–72, was the head of the school. He studied painting, sculpture, and architecture under Giulio Romano. He also imitated the works of Titian (at least in coloring) and Pordenone with such success that his pictures have sometimes been ascribed to both of these artists. His female heads, like those of his brothers, are remarkably beautiful.

ANTONIO C. studied, under his brother, both painting and architecture. His knowledge of the latter was very serviceable in several of his paintings; for example, that of the sacristy of St. Peter. He was also a plastic artist, an engraver, and the historian of his native place.

VINCENZO C., before 1532–91, seems to have followed the guidance of Antonio rather than that of Giulio, and excelled in small figures. His paintings of fruits are highly valued.

BERNARDINO C., 1522—abt. 1590, kinsman of the three brothers C., was the most famous of the whole. Lanzi terms him ‘the Annibale Caracci’ of the school. He studied first under Giulio C., but soon excelled his master. Afterward, he chose Giulio Romano, Titian, and Correggio as models, but chiefly followed Raphael, yet without servile imitation. Many of his works are found in Milan and Cremona. In the latter place, the cupola of the choir in the church San-Gismondo is Bernardino’s masterpiece. He was distinguished as a portrait-painter, and engraver. The lady-painter, Sophonisba Anguissola, was a distinguished pupil of Bernardino Campi.

CAMPIAN, or CAMPION, *kām'pī-ŭn*, EDMUND: 1540–81, Dec. 1; b. London. He studied at Oxford, became a fellow of St. John’s College, delivered an oration before Queen Elizabeth 1566, and was ordained deacon 1567. Going to Ireland, he wrote its *History* (published 1633), and became a Rom. Cath. He entered the English college at Douai, and was admitted a Jesuit at Rome 1573. After writing a tragedy at Vienna and teaching rhetoric and philosophy at Prague, he was sent to England 1580 by Gregory XIII., and boldly challenged the clergy and universities to a debate. Making too many converts, he was charged with treason, put to the torture, executed at Tyburn and the parts of his body exposed in several towns, while the Duke of Anjou was in England wooing the queen. Wood [*Athen. Oxon.*] says all writers accounted C. ‘a man of most admirable parts, an elegant orator, a subtle philosopher and diputant, and an exact preacher, whether in English or Latin.’ He wrote several books in Latin. His *Life* was written by Paul Bombino.

CAMPION, n. *kām'pī-ŭn* [It. *campiōnē*, champion]: the corn-campion; a name for various species of common wild plants, as *catch-fly*, *cuckoo-flower*, and *bachelor’s button*, belonging to the genus *Lychnis*, ord. *Caryōphyllacēæ*: see LYCHNIS: SILENE.

CAMPINAS—CAMPO-FORMIO.

CAMPINAS, *kâm-pê'nâs*, or **SAN CARLOS**: town of Brazil, in the province, and 70 m. n. of the city, of Sao Paulo; in a fertile and picturesque district, on a small river, the Piraticaba, a feeder of the Parana. There are large coffee and sugar plantations in the surrounding district, and large quantities of sugar are exported. Many of the houses are built of mud or clay, and the immense church, whose walls are five ft. thick, is composed of beaten earth. Pop. 12,000

CAMPOBASSO, *kâm-pô-bâs'sô*: province of s. Italy, formerly Molise; bounded n.w. by Chieti, n.e. by the Adriatic, s. by Benevento, s.w. by Caserta; 1,777 sq. m. It contains three districts, has one river, the Biferno, and a mountainous surface, rising at Monte Miletto to a height of 6,740 ft. C. produces grain and wine, and has some manufactories of iron and steel. Pop. (1896) 576,191; (1901) 366,571.

CAMPOBASSO, *kâm-pô-bâs'sô*: fortified town of s. Italy, in the province of the same name, about 53 m. n.n.e. of the city of Naples. The town stands on the slope of the Monte Verde, in a cool, airy, and healthful region. It has a fine cathedral, a ruined castle, some convents, and palaces belonging to resident nobles. It has manufactures of cutlery, which has considerable reputation for excellence. Its situation, though far from inviting as regards scenery, is favorable for trade, which is facilitated by good roads. Pop. (1901) 15,030.

CAMPOBELLO, *kâm-pô-bêl'lô*: island of New Brunswick, situated at the mouth of the Passamaquoddy Bay, 2 m. from Eastport, Me.; lat. 44° 57' n., long. 66° 55' w. It is 9 m. long, and 1-3 m. broad; but it is valuable, possessing some good harbors, and, at its n. end, a light-house 60 ft. in height. Ores of copper and lead have been found. The people are mostly fishers. In recent years it has gained some note as a summer resort.

CAMPO DE CRIPTANA, *kâm'pô dâ krêp-tá'nâ*: town of Spain, in the province of, and about 50 m. n.e. of the city of, Ciudad-Real. It has manufactures of coarse cloths, and some trade in corn and fruits. Pop. 6,250.

CAMPO-FORMIO, *kâm'po fawr'mê-o*: village in the province of Udine, n. Italy, about 7 m. s.w. of the city of Udine; noted for the treaty of peace here concluded, 1797, Oct. 17, between Austria and the French Republic. After subjugating Italy (1796), the French army had crossed the Noric Alps, and threatened Vienna. Austria, therefore, hastened to arrange preliminaries of peace. In the treaty which was concluded by Bonaparte with the Count of Coblenz, 1797, Oct. 17, Austria ceded the Netherlands, Milan, and Mantua, and received as compensation the districts Istria, Dalmatia, and the left bank of the Adige in the Venetian states, and the capital, Venice; while France took the remaining territory of Venice, its possessions in Albania, and the Ionian Islands. In the secret articles of the treaty, Austria, in ceding the left bank of the Rhine, was to receive as compensation Salzburg and the Bavarian district on the Inn; and promises were held out to the Duke

CAMPOMANES—CAMPO SANTO.

of Modena, and other Italian houses, that their concessions should be compensated at the cost of Germany.

CAMPOMANES, *kám-po-má'nēs*, PEDRO RODRIGUEZ, Count of: 1723–1802, Feb. 3; b. Asturias, Spain: Spanish minister and director of the Royal Acad. of History at Madrid, founded by Philip V., 1738. His talents and learning were devoted to the advancement of his native country. By his enlightened views of state policy, as well as by his writings, he obtained great reputation throughout Europe. He gave effectual assistance to Count Aranda in his difficult enterprise of driving the Jesuits out of Spain. C.'s chief works are—*Antigüedad Marítima de la Republica de Cartago con el Périplo de su general Hannon, traducido del Griego y ilustrado* (Madrid, 1756); *Discurso sobre el fomento de la Industria popular* (1771); *Discurso sobre la Educacion popular de los Artisanos y su fomento* (1775); *Apéndice al a Educacion popular* (1775–1777). The best known of his financial productions is *Tratado de la Regalia de Amortizacion* (Madrid, 1765).

CAMPO SANTO, *kám'po sán'to* [Holy Field]: Italian designation for a cemetery or burying-ground, but especially for an inclosed place of interment, surrounded internally by an arcade, and intended for the remains of persons of distinction. The most famous C. S., and that from which the others derived the name, is that of Pisa—in the neighborhood of the dome, and consecrated to the memory of men who had deserved well of the republic. It was founded by Abp. Ubaldo, toward the end of the 12th c. The archbishop, having been driven out of Palestine by Saladin, brought his 53 vessels, which had been destined for the conquest, laden with the earth of the Holy Land. This he deposited on the spot which was thence called the Holy Field, and which gave its name as a generic term to the burying-grounds of Italy. The architect of the existing building was Giovanni Pisano, under whose superintendence it was completed, 1283. It contains an area of 400 ft. in length, and 118 in breadth; and is surrounded by a lofty wall, on the inner side of which a wide arcade runs round the whole inclosure, giving to it the character of one magnificent cloister. At the smaller e. side there is a large chapel, and two chapels of smaller size on the n. side. The lofty circular arches of the arcade are filled with the richest Gothic tracery, which belongs, however, to a later date—the latter half of the 15th c. The walls are adorned with frescos, of great interest and value in themselves, and with reference to the history of art. The oldest of those which have been preserved adorn one side of the e. wall: they represent the passion of Christ, his resurrection, and other sacred subjects. These remarkable paintings are supposed to date before the middle of the 14th c., and are ascribed to Buffalmaco. But the most marvellous productions are those of Giotto (q.v.), of Simone Memmi, the friend of Petrarch, and of Andrea and Bernardo Orcagna. As a museum of classical antiquities, the C. S. is perhaps

CAMPTOTROPAL—CAMPVERE.

more remarkable than in any other point of view. Altars, sarcophagi, bas-reliefs, statues, inscriptions, all that is interesting or curious which has come into the possession of the Pisans for centuries, they have accumulated within its walls.

CAMPTOTROPAL, a. *kămp-tôt'rô-păl* [Gr. *kamptos*, flexible, bent; *tropos*, a turn]: in *bot.*, having curved ovules when the portions on either side of the line of curvation are equal; curved like a horse-shoe.

CAMPUS, *kămp'ūs*: from a Sicilian word signifying race-course; in antiquity, an open space or park given up to exhibitions, combats, exercises, etc.: Rome had eight, the chief being the *Campus Martius*. This was outside the walls, between the Tiber and the Capitoline and Pin-cian hills. Here stood the temple of Mars, and here, from mythical days, the *Comitia Centuriata* met. In the legends, Tarquinius Superbus sowed it with grain, but Brutus and Collatinus restored it to popular use. Here the youth were exercised, and the bodies of the great cremated; here the *villa publica* was erected for magistrates and ambassa-dors. By degrees it became a pleasure ground. Cæsar put up halls for the *Comitia*; Agrippa, the Pantheon and the first public baths; Augustus, his mausoleum and the Egyptian obelisk; and Taurus, the first stone amphi-theatre. Under the empire it was filled with public and private buildings, the ruins of which make it one of the most interesting parts of Rome. Aurelian inclosed it within the walls.—The College Campus, in modern times, is the space about the college buildings. For uses of sport and contest it has been mainly displaced of late years by the athletic grounds and the gymnasium.

CAMPVERE, *kămp'vär*, now called **VERE**, **VEERE**, or **TER-VERE**: small fortified town on the n.e. of the island of Walcheren, in the Netherlands province of Zealand, four m. n.e. of Middelburg. It has a port on the Veer-sche Gat, which runs from the Sloe to the Roompot, separating Walcheren from North Beveland. The town has fallen into decay; but its former prosperity is indicated by the town-house of white freestone, with elegant tower, and the front ornamented by statues of several lords and ladies of the house of Borssele; and by the large and beautiful cathedral church, no longer used. Popula-tion, about 900. C. owed its name to the ferry [Dutch, *veer*] thence to the village of Campen, in North Beveland, the site of the present hamlet of Kamperland.

From a historical point of view, C. is a town of great interest. In 1304 it was the scene of a battle between William, Governor of Holland and Zealand, and Guy, Count of Flanders, who was victorious. In 1572 the Spaniards were driven away; and a century later, C. was the first town which proclaimed William III., the Prince of Orange, general stadtholder. It is interesting chiefly as the seat of a Scottish factory or commercial station for three and a half centuries. Wolfaard van Borssele, Lord of Campvere, having, in 1444, married a princess of the

CAMPYLOSPERMÆ—CAMUCCINI.

Stuart line, an impulse was given to the Scottish trade. A factory of merchants was formed, and by contract between the royal burghs of Scotland and the United Provinces, C. became the only staple port. The goods could not be transferred to any other place until sold, merchants resorting thither to do business. The factors obtained many privileges, such as freedom from several duties and the right of being governed by the law of Scotland, having a lord conservator who was supreme judge in all matters. No factor might settle at C. without the written authority of the commissioners of royal burghs of Scotland, who took security for his honorable behavior. In 1795 the Batavian republic withdrew the privileges, and the factory was broken up, but the conservatorship was held as a sinecure long after the necessity for the office had ceased, the name of Sir Alexander Ferrier appearing in the *Edinburgh Almanac* as 'conservator at Campvere' so lately as 1847. The magistrates of C. were bound to provide a church for the factory, 'to the end that the people of the Scottish nation be not frustrate of the Word of God and exercise of the reformed religion in their own proper language.' The ministers were appointed by the commissioners of royal burghs, 1613-1790, when the last appointment was made.

CAMPYLOSPERMÆ, n. plu. *kām'pī-lō-spēr'mē* [Gr. *kam'pulos*, bent, curved; *sperma*, seed]: seeds with the albumen curved at the margins so as to form a longitudinal furrow. **CAM'PYLOSPER'MOUS**, a. *-spēr'mūs*, having the albumen of the seed curved at the margin, thus forming a longitudinal furrow.

CAMPYLOTROPAL, a. *kām'pī-lōt'rō-pāl*, or **CAM'PYLOT'ROPOUS**, a. *-rō-pūs* [Gr. *kam'pūlos*, bent, curved; *trōpaō*, I turn]: in *bot.*, having the ovule and its integuments so bent that the apex is brought near the hilum, the hilum and chalaza being together.

CAMTOOS, *kām-tōs'* or *kām-tós'*, or **GAMTOOS**, *gām-tós'*: river of the e. division of the Cape Colony, 200 m. in length. It rises in the Nieuwveld Mountains, near lat. 32° s., and, flowing through the inland dist. of Beaufort, and the maritime dist. of Uitenhage, falls into that inlet of the sea which is immediately w. of Algoa Bay. It is valuable as an aid to irrigation. For instance, Hankey, a station of the London Missionary Soc. on its banks, is thoroughly watered by means of a tunnel carried through solid rock at the expense of the association just mentioned.

CAMUCCINI, *kā-môt-chē'nē*, **VINCENZO**: 1775-1844, Sep. 2; b. Rome: historical painter. The school of which he became the head was founded on the theatrical antique style of the French painter David. The first important works by C. were the *Assassination of Caesar* and the *Death of Virginia*; both painted for Lord Bristol at the commencement of the present century. His picture of *Unbelieving Thomas* was copied in mosaic for St. Peter's Church. For the church of San Giovanni in Piacenza he executed a *Presentation in the Temple*, which was greatly

CAMUS—CAMWOOD.

admired. These works were followed by many scenes from Roman history; among them, the pictures of *Horatius Cocles*, and *Romulus and Remus* as children. C. was highly honored for his character as well as his art. He died at Rome.

CAMUS, a. or n. *kā'mūs* [F. *camus*]: in *OE.* flat-nosed; a pug-dog.

CAMUS, n. *kā'mūs* [It. *camicia*, a shirt—from mid. L. *cāmīsa* (see under CAMISADE)]: in *OE.*, a thin loose dress of silk or other material.

CAMUS, *kā-mūs*, ANTOINE LE: 1722–1772; b. Paris: celebrated physician. He became prof. in the Univ. of Paris, 1762, was noted for the original character of his technical publications and his literary ability, and was the author of a comedy, *Love and Friendship*, a poem *The Medical Amphitheatre* (1745), *Maladies of the Region of the Heart*, and *The Medicine of the Mind* (1753).

CAMUS, *kā-mūs'*, ARMAND GASTON: 1740, Apr. 2—1801, Nov. 2; b. Paris: prominent in the French Revolution. On account of his superior knowledge of ecclesiastical law, he was elected advocate-general of the French clergy. He was a zealous and ascetic Jansenist, with extraordinary firmness of character. He hailed the movements of 1789 with joy, and was elected member of the states-general by the people of Paris. In this position, he appeared as the resolute foe of the ancient régime. He gained possession of, and published, the so-called *Red Book*, giving accounts of court expenditure, which was highly disadvantageous to the court and its ministers. After the flight of Louis XVI., C., with Montmorin, Lafayette, and Bailly, accused the king of treason and conspiracy, and insisted on the suppression of all orders and corporations based on hereditary rights. As conservator of the national archives, he rendered an important service by preserving from destruction the old documents of the abolished corporations and institutions. He was absent in Belgium during the king's trial, but sent his vote for death. In 1793, March, when he was commissioned to make prisoners of Dumouriez and other generals suspected of treason, C. himself and his four colleagues were taken prisoners and delivered over to the Austrians (Apr. 3); but, after an imprisonment of two and a half years, he was exchanged for the daughter of Louis XVI. On his return to Paris, he was made member of the Council of Five Hundred, of which he became pres. 1796, Jan. 23, but resigned 1797, May 20, and gave his time to literature. Remaining true to his principles, he voted, 1802, July 10, against Napoleon's proposed consulship during life. C. died of apoplexy.

CAMUSAT', *kā-mū-zā'*, NICOLAS: 1575–1655; b. Troyes: priest and antiquarian. He held the appointment of canon of the church in his native city, and wrote many works, one of the most famous being *Mélanges historiques* (1619).

CAMWOOD. c. *kām'wūd*: a red dyewood, obtained

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principally from the vicinity of Sierra Leone, where it is called *kambi*, whence the name: it is called also *barwood*. It yields a brilliant but not permanent red color, and is used with sulphate of iron to produce the red in English bandana handkerchiefs. It is the wood of *Baphia nitida*, a tree of the nat. ord. *Leguminosæ*, sub-order *Cæsalpinieæ*, native of Angola. It is preferred to Brazil wood (q.v.), as producing a finer and richer red.

CAN, n. *kǎn* [Icel. *kanna*, a large drinking-vessel: Ger. *kanne*, a tankard: W. *cannu*, to contain: AS. *canne*]: a cup or other vessel made of metal. CAN'AKIN, n. -ǎ-kǐn, a little can.

CAN, v. *kǎn* [AS. *cunnan*; Icel. *kunna*, to ken, to know: M.H.G. *kunnen*, to be able]: *can* denotes power or ability when joined to another verb, as I *can* eat—that is, I have power to eat; in *OE.*, to know or understand. COULD, pt. *kûd*. *Note.*—*Could* is a mis-spelling for *coud* [OE. and Scot. *coud*], the *l* having been inserted from a supposed analogy with *should* and *would*.

CANA, *kā'na*, OF GALILEE: scene of our Lord's first miracle; about 13 m. w. of the Sea of Galilee. Two modern villages claim to represent the sacred site, and authorities are divided as to the identification. One village, now called Kefr Kenna, is about 3 m. n.e. of Nazareth; the other, Kana el Jelil, is about 8 m. n. of Nazareth. Robinson supports the claim of the latter. Stanley considers the claims about equal.

CANAAN, *kā'nan* or *kā'na-an*: fourth son of Ham and grandson of Noah. C.'s 10 sons were progenitors of 10 Syrian tribes, and the whole land of Palestine was named from him. To his eldest son, Zidon, is attributed the founding of the city of Sidon.

CANAAN, LAND OF:—CANAANITES: see PALESTINE: SYRIA.

CANAANITE, a. *kā'nan-īt* or *kā'nā-an-īt*: pertaining to or of the land of Canaan: N. a native of the land of Canaan.

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CANADA, *kǎn'a-da* [corrupted from the Iroquois *Kannatha*, 'a village']: geographical designation variously applied in the history of N. America. Originally it comprised an extensive range of country reaching, under the French, as far even as the Mississippi, away beyond the boundary lakes. It was subsequently limited to a region chiefly in the basin of the St. Lawrence—including in that term the lakes with the river. This district was divided in 1791 into two provinces, Ontario and Quebec, or Upper and Lower Canada; but these two, after being politically reunited, 1840, were again dissociated only to enter together as separate members of the Confederation—the Dominion of Canada—in 1867, July 1, when an act of the imperial parliament (passed Mar. 29) came into effect, uniting the separate provinces into one federation.

The union of the various British American provinces had been long and eagerly discussed, public opinion in Canada being generally in its favor, but in the other provinces strongly opposed to it, from the natural apprehension that the immense preponderance of C. in population, wealth, and general importance would utterly swamp the others. However, after much and careful consideration, the great advantages which it was shown the scheme would confer, overcame the provincial jealousies, the pro-federalists in Nova Scotia and New Brunswick came to preponderate, and these two provinces were in 1867 united with Quebec and Ontario to form the Dominion of Canada. In British Columbia and the Hudson's Bay Territories the feeling in favor of annexation was strong, and in 1869 the latter, and 1871 the former, was transferred to the imperial government. The Hudson's Bay Company (q.v.) received an indemnity of £300,000. In 1871 the Red River Settlement was formed into a province under the name Manitoba. In 1873 Prince Edward Island was annexed. The only part of British North America which stands aloof is Newfoundland, but provision has been made for its admittance in the Act of Union, and its accession cannot be long deferred. The area of the vast dominion is about 3,500,000 sq. m., almost equal to that of the United States, and little inferior to Europe. The boundaries of the Dominion are: on the e. the Atlantic Ocean, Labrador, Davis Strait, and Baffin's Bay; on the w. the Pacific Ocean and Alaska; on the n., the Arctic Ocean and Alaska; and on the s., s.e., and s.w., the United States.

The constitution of the Dominion is after the model of the mother-country. The parliament consists of the king, an upper house styled the senate, and a house of commons. The crown is represented by a governor-general (salary £10,000) who exercises his authority with the aid and advice of a council, styled the king's privy council for Canada, chosen from time to time by the governor. The senate, under the constitution, consists of 81 members, 24 for each of the provinces of Ontario and Quebec, and the rest for the other provinces. The senators are chosen by the gov.-gen. and hold the appointment for life. Among other qualifications, a senator must

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have real property to the value of \$4,000, and must be resident in the province for which he is appointed. The speaker of the senate is nominated by the gov.gen. The house of commons, under the census of 1901, consists of 213 members—Ontario 92, Quebec 65, Nova Scotia 20, and 36 for the rest of Canada. Duration of a house of commons is 5 years. Until the parliament of Canada otherwise provides, the franchise and other regulations are to be the same as those hitherto in force in returning members to the house of assembly in the several provinces. The house of commons elects its own speaker. Any bill passed by the houses of parliament, even though assented to by the gov.gen. in the queen's name, may afterward be disallowed by the queen in council. Each province has an executive and legislature of its own, presided over by a lieut. gov. and constituted in the meantime much as before the union. The lieut.governors are appointed by the gov.gen. The provincial parliaments may, under the provisions of the act, amend from time to time their own constitutions.

In the distribution of legislative power between the general and the provincial parliaments, certain classes of subjects of a local nature are assigned exclusively to the legislatures of the provinces, while subjects of more general concern are assumed by the parliament of Canada. Among the subjects enumerated in the act as coming under the latter description are: the public debt and property; taxation (for federal purposes), postal service, military and naval defense, the salaries of the civil officers of the general government; the census; navigation; money, weights, and measures; copyrights; marriage and divorce; criminal law. The provincial legislatures have the power of taxing their provinces for provincial purposes, and of borrowing money on the sole credit of the province; of regulating and paying provincial officers; of establishing asylums, etc. Education is also left to the provincial legislatures, with certain provisions against encroachment on the rights of religious minorities.

The debts of the several provinces, at the union, are assumed (with certain limitations) by the federal government; and, on the other hand, certain duties and revenues, and certain public works and properties belonging to the several provinces before the union, are taken possession of, to form a consolidated revenue fund for defraying the interest of these debts, and for the other expenditure of the federal government.

Provision is made for the introduction of uniformity of laws, which, however, must be with consent of the legislatures of the several provinces.

History.—In 1535, Jacques Cartier, a French navigator (b. St. Malo, 1494), entering the St. Lawrence on the festival of the saint of that title, took nominal possession of n. America in the name of his king, Francis I. In 1608, Quebec was founded by De Champlain; and here, 15 years later, he built Fort St. Louis, from which stronghold France ruled for 150 years a vast region extending east-

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ward to Arcadia (now Nova Scotia), westward to Lake Superior, and ultimately down the Mississippi as far as Florida and Louisiana. The Recollet and Jesuit missionaries traversed the country in all directions, and underwent incredible hardships in their zeal for the conversion of the Indians. These fearless priests were the pioneers of civilization in the Far West, and to one of the most intrepid—Lasalle—is due the discovery of the Mississippi valley. In 1670, Charles II. granted to Prince Rupert and his company, known ever since as the Hudson's Bay Company, the perpetual exclusive right of trading in the territory watered by all the streams flowing into Hudson's Bay. Garrisoned forts were now raised at suitable points, and the bitter enmity between the French and the English traders frequently led to bloody struggles, in which sometimes the Indians also took part. The most warlike native tribe was that of the Iroquois, who were persistent enemies to the French, while the peaceful Hurons were steady allies. In 1663, one of the most remarkable earthquakes on record occurred in C. Meanwhile, the wars on the American continent followed the course of the wars in Europe, until the long struggle between France and England for supremacy in America, came to a close on the 'Plains of Abraham' in 1759, when General Wolfe defeated Montcalm. This victory opened the gates of Quebec. The capitulation of Montreal next year brought to a close the era of French dominion in C. The people of the conquered country were secured, by the terms agreed to, in the free exercise of their religion; and peace was concluded between Britain and France, 1763, when C. was formally ceded to England, and Louisiana to Spain. In the same year, a small portion of the recently-acquired territory was by royal proclamation organized under English laws. In 1774 the new province was extended by parliamentary enactment, and that under French laws, down the Ohio to its confluence with the Mississippi, and up the latter stream to its source. Finally, C. receded to its present limits in 1783, giving up to the American republic at the close of the revolutionary war, the sites of six states—Minnesota, Wisconsin, Michigan, Ohio, Indiana, and Illinois. In 1791 C. was divided, under separate legislatures, into two sections—the eastern retaining French institutions, and the western receiving those of England; and these sections, again, after political discontent had in each ripened into armed insurrection, were reunited for legislative purposes in 1840. In 1763 the French population amounted to about 65,000, occupying the immediate banks of the lower St. Lawrence and its tributaries. Excepting within the cities of Montreal and Quebec, the immigrants of a different origin, whether from the old colonies or from the mother-country, scarcely attempted to establish themselves among the ancient settlers; thus producing a kind of reciprocal isolation, which, even down to the present day, has not been materially disturbed. In general, therefore, the two grand elements of the provincial population are locally distinguished from

each other—a relative position which has happily excluded, as between them, nearly every difficulty as to education and religion. The settlers of French origin, almost entirely confined to Lower C., occupy the banks of the St. Lawrence and of the lower courses of its tributary streams; all the rest of Lower C. and the whole of Upper C., so far as they are reclaimed at all, are occupied by colonists of English race.

Physical Aspect.—The most striking physical features of C. are the Rocky Mountains, the Laurentian range, and the chain of immense fresh-water lakes. Much of the surface is hilly, though there are comparatively few great mountains. Hills of no great height skirt the coasts of Nova Scotia, Cape Breton, and Labrador; and the southern bank of the St. Lawrence is fringed by a long range, called the Notre Dame Mountains, a spur of the Alleghanies, which reaches its greatest height of 4,000 ft. at its commencement in the Gaspé peninsula, on the Gulf of St. Lawrence. The Laurentian range lies n. of the St. Lawrence, and extends parallel with that river from the border of Labrador, then skirts the n. side of the Ottawa River, and stretches away toward the Arctic Ocean. The total length of the range is about 3,500 m. It forms the water-shed between the affluents of the St. Lawrence and of Hudson's Bay, and its height varies from 2,000 ft., near Lake Superior, to 3,000 ft. between Quebec and Lake St. John. Westward of Lake Superior extends a broad fertile plain almost to the base of the Rocky Mountains. These stretch in a triple chain parallel with the Pacific coast-line to the Northern Ocean. The most easterly of the three chains is the highest, and reaches in Mount Brown and Mount Hooker a height of more than 15,000 ft. Minor chains between this range and the Pacific are the Selkirk Mountains and the Cascade Mountains, with peaks 7,000 ft. in height. Much of the surface of C. has a terraced character, and to this are due the numerous falls and rapids which obstruct the navigation of the principal rivers. The system of the St. Lawrence alone, with the great lakes Superior, Huron, Michigan, St. Clair, Erie, and Ontario, occupies 333,000 sq. m. These lakes, with their outlet, from the greatest fresh-water way in the world. A continuous chain of great fresh-water lakes extends through Ontario and the Northwest Territory, in a n.w. direction toward the Northern Ocean, the principal being Nipissing, Simcoe, Nipigon, Lake of the Woods, Manitoba, Winnipeg, Athabasca, Great Bear, and Great Slave Lakes. Next to the St. Lawrence, the chief rivers are: the Saskatchewan and the Winnipeg, flowing into Lake Winnipeg, and the Nelson, flowing from it into Hudson's Bay; the Assiniboine and the Red river, which join their waters to flow into Lake Winnipeg; the Albany and the Churchill, emptying into Hudson's Bay; the Athabasca and the Peace rivers, flowing into Lake Athabasca, and the Slave river, from it into Great Slave Lake; the Mackenzie, fed from both the Great Slave and the Great Bear Lakes, and emptying into the Arctic Ocean;

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the Fraser and Thompson, in British Columbia, emptying into the Pacific; and in the eastern provinces, the Ottawa, chief tributary of the St. Lawrence, itself fed by the Gatineau and Matawan; the Saguenay, emptying Lake St. John into the St. Lawrence; and the St. John, which flows into the Bay of Fundy, after a course of 500 m. in New Brunswick, which it partly separates from the state of Maine. The principal islands of the Dominion are; on the e., Cape Breton, Prince Edward and Magdalen Islands, and Anticosti, in the Gulf of St. Lawrence: and on the w. coast, Vancouver Island, and Queen Charlotte Island. Lying along the n., in the great Arctic archipelago, are Baffin Land, including Cumberland and Cockburn Land, Prince Albert and Victoria Land, Banks Land, Prince of Wales Land, North Somerset, North Devon, and Parry Islands.

Climate, Agriculture, Products.—The heat in summer and the cold in winter are greater than in corresponding European latitudes; but the test by thermometer gives an exaggerated impression of the severity of a Canadian winter. Throughout the greater part of the winter the sky is bright and clear, and the air dry and bracing. In Quebec, snow begins to lie on the ground early in November; in Ontario, not till a month later; and it usually disappears in the former province about the middle of April, in Ontario a month earlier. The mean temperature for the year is, at Quebec, $42^{\circ}6$; Ontario, $43^{\circ}8$; in Manitoba, $32^{\circ}6$; and at Halifax, $43^{\circ}1$. Winnipeg has the extremes of 96° in summer and 38° below zero in winter. The annual rainfall in inches at Quebec is 19.26; at Toronto 29.42; at Halifax, 43.08; and at Winnipeg, 16.83. The total fall of snow in inches in the year is, in Ontario, 95.9; in Quebec, 115; in Manitoba, 62.5; and in British Columbia, 33.5. Agriculture is the chief interest and industry of C., about half the population belonging to the farming class. The annual yield (census 1900) of wheat was 51,352,047 bu.; the acreage under crop (1891) 19,904,826. an increase of 13,519,264 acres since 1881. An active trade in beef and cattle has sprung up with England, which is expected to largely increase as soon as ry. communication is completed with the western provinces. The total agricultural animal exports for 1900 amounted to \$81,858,450. Fruits and vegetables grow in much greater profusion than in England. One-half of the surface is still covered with forests, and the annual value of the timber exported is about \$27,703,647. The chief forest trees are the white and the red pine, the elm, beech, ash, maple, walnut, cedar, birch, and tamarac. The chief wild animals are deer, bears, wolves, foxes, beavers, and squirrels. Herds of buffalo are met with in the more remote regions; beyond them the moose, wapiti, reindeer, the white arctic fox, and the polar bear. Fur-bearing animals abound in the tracts round Hudson's Bay, westward to the Rocky Mountains, and northward to the Arctic Ocean. The rivers, the lakes, and the sea-shores are plentifully stocked with fish. Exports of cheese (1894) \$15,488,191.

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Dominion Statistics.—Since the confederation in 1867, and the subsequent admission of all the continental provinces, the prosperity of the Dominion has been great. New railways have been projected, including one across the entire continent to the Pacific, and fresh avenues of native and foreign trade have been opened. The constitution of the Dominion is similar to that of the mother country. Ottawa is the political capital. The portion of the Hudson Bay territory known as Red River Settlement (q.v.), Selkirk Settlement, or Assiniboia, was in 1870 erected into the province of Manitoba. The district to the n. and e. of Manitoba has been known since 1876 as Keewatin. The region toward the n.w. was organized as a territory 1875, under the name of the Northwest Territory. Under this comprehensive term is included all the land area of the Dominion north of the St. Lawrence valley, and not already embraced within the provinces of Quebec, Ontario, Manitoba, British Columbia, and the district of Keewatin. It thus includes all the unorganized land surface of the Dominion; and in 1881 it was subdivided into four districts, Assiniboia, Saskatchewan, Alberta, and Athabasca. While the seven settled provinces occupy but 700,000 sq. m., the Northwest Territories cover an area of nearly $2\frac{1}{2}$ million sq. m.

Much of the northernmost area of the Dominion is of course uninhabitable; but in 1881, the tour through Manitoba and the Northwest Territories by the gov.gen., the Marquis of Lorne, directed public attention to the boundless agricultural resources of the enormous areas of 60° , and stimulated emigration to what is probably the finest wheat-growing country in the world. The population of the Dominion (excluding Newfoundland which in 1869, had a pop. of 146,536, and 1901 of 217,037) at the census of 1881 was 4,324,810; of 1901, 5,338,883.

PROVINCES.	Area in Sq. Miles.	Pop. 1901.
Nova Scotia	20,600	459,574
New Brunswick.....	28,200	331,120
Prince Edward Island	2,000	108,259
Quebec	347,350	1,648,898
Ontario	222,000	2,182,947
Manitoba	73,956	255,211
British Columbia.....	383,300	178,657
The Territories.....	2,576,140	145,773
Total.....	3,653,946	5,371,315

The following are the most important cities according to census of 1901: Montreal, 267,730; Toronto, 208,040; Quebec, 68,840; Ottawa, 59,928; Hamilton, 52,634; Halifax, 40,832; St. John, 40,711; Brantford, 16,619; Kingston, 17,961; St. Henri, 21,192; London, 37,981; Charlottetown, 12,080; Petersborough, 11,239; Sherbrooke, 11,765; Sydney, 9,909; Stratford, 9,959; Three Rivers, 9,981; Mile End, 10,933; Hull, 13,993; Ste. Cunegonde, 10,912. Native born pop. of C. constitutes 87 p. ct. of whole. In 1901 there were 184,657 British and foreign born.

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Church and Education.—There is no state church in C. In 1891, there were 1,992,017 Roman Catholics in the Dominion, the mass of the inhabitants of Quebec province being French. The Presbyterians numbered 755,326; the Methodists, 847,765; Baptists, 302,565; and the Episcopal Church, 646,059. Lutherans (63,982), Congregationalists, Mennonites, and many other sects are represented. The Prot. Episc. Church is governed by 9 bishops, and the Rom. Cath. Church by 4 archbishops and 14 bishops.

Education is carefully fostered in the Dominion. The province of Ontario has some 6,156 educational establishments, including over 20 that are called colleges. Quebec has 3 universities, one being Rom. Catholic, and above 20 classical and industrial colleges. Nova Scotia has a university at Halifax; and Manitoba has already a university at Winnipeg. Over 500 newspapers and periodicals are published in C., mostly in Ontario.

Finances.—The revenue for C. for year ending 1901, June 30, was \$52,514,701; expenditure \$46,866,368; balance \$5,648,333. The debt was \$268,480,004; increase over 1900 \$2,986,197, caused by expenditures on railways and canals, changes of management on loans, etc. The total revenue from the post office dept. (1901) was \$4,641,608; expenditure \$5,153,622.—The value of exports for 1901 was \$196,487,632; imports for home consumption \$181,237,988; total imports \$190,415,525.—In the 5 months July-Nov. of the fiscal year 1892-3 the exports showed an increase of \$5,256,943 over the same period 1891-2; imports an increase of \$3,572,277. Total revenue for the 5 months \$15,662,770, expenditures \$11,757,794; increase of surplus during the 5 months \$1,412,826.

Commerce.—The trade of the Dominion is chiefly with Great Britain and the United States. Of a total exportation of \$96,749,149 in 1890-1, 48 millions went to Great Britain and 41 millions to the United States; while of a total importation of \$122,000,000, 52 millions came from Great Britain and 43 millions from the United States. The staple articles of export are cheese, timber, and breadstuffs; also fish, furs, cotton, etc., and minerals. The chief imports from the United Kingdom are iron, wrought and unwrought, woolen manufactures, and sugar. In the fiscal year 1901-2 the exports aggregated in value \$211,640,286, and the imports, \$212,270,158, of which \$202,791,595 was for home consumption.

Shipping.—The merchant shipping of C. is important and, considering its population, remarkably extensive. In 1895, C. had 7,245 registered vessels of 859,624 tons; of these 1,640 were steamers. The number of sea-going vessels (1894), entering and clearing at Canadian ports, was 28,340 of 11,280,536 tons. The tonnage of vessels employed in the coasting trade (1894) was 26,560,968 tons. In 1893, there passed through the Dominion canals 25,342 vessels, of 4,720,349 tons, carrying 134,189 passengers and 3,546,989 tons of freight, chiefly grain, timber, and coal.

Fisheries.—The total produce of the Canadian fisheries in 1900 was valued at \$21,557,639. In that year fish to the

value of \$11,169,083 were exported. This includes the fisheries of British Columbia, but of course excludes those of Newfoundland. In 1901 there were seven establishments in C. for artificial fish-culture, from which, in the preceding year, 145,996,000 young fish (salmon, speckled trout, and whitefish) were sent forth into the waters of the Dominion.

Mines.—The total value of the mineral product (1901) was \$69,407,031. The chief product is gold, 1,350,176 ozs., valued at \$27,908,153. Among other minerals are coal, nickel, asbestos, petroleum, copper, and silver.

Canals and Railways.—In facilities for communication C. is unrivalled. The St. Lawrence, with its lakes, puts great part of it in connection at once with the most commercial portion of the United States and with the open ocean. The navigation of this great water system has been greatly assisted by numerous and extensive canals, of which the Rideau and the Welland are the most important supplement to the main artery. The revenue of the canals (1901) amounted to \$12,717,343. C. has an immense and steadily increasing network of railways. In 1901, there were in operation about 18,294 m. of railway; 1889, 12,000 m.; (1901) 82,335 m. of telegraph. The Grand Trunk railway, 1,388 m. in length, gives unbroken communication between Portland and Detroit. The Victoria bridge, by which the railway crosses the St. Lawrence at Montreal, is one of the wonders of the world. The completion of the Canadian Pacific railway, 1885, Nov. 7, gave railway communication westward from Montreal, its eastern terminus, to Vancouver, in British Columbia—a distance of 2,906 m., or, from Quebec, a distance of 3,039 m. Every week-day one train leaves each end of the line, and the continent is crossed in 3 days 17 hours, a period which, it is expected, will be reduced. Work was commenced in 1885, Oct., on a railway connecting Winnipeg with Port Nelson, on Hudson's Bay, whence it was expected a shipping route to England through Hudson's Strait would be available in the summer, about 1,000 m. shorter than from Quebec.

Army and Naval Force.—The number of imperial troops in C. was in 1871 reduced to 2,000 men, who formed the garrison of the fortress of Halifax, still accounted an 'imperial station,' as it is also the headquarters of the British fleet in these waters. C. has besides a large volunteer force, and a recently organized militia, consisting of all male British subjects in C. between the ages of 18 and 60. The active militia consisted in 1895 of 33,960 officers and men, and the reserve comprised abt. 700,000. C. is divided into 12 military districts; there is a royal military college at Kingston, and several centres of military instruction. The naval armament of C. consisted in 1895 of 20 armed steamers, besides other fast steamers available as gunboats. There is at present no active marine militia. The imperial govt. maintains at Esquimalt, a port of Brit. Columbia, a navy-yard, hospital, etc., and it is proposed to fortify the place strongly.

Money, Weights and Measures.—The decimal system of currency was introduced in 1871, the unit of account being the dollar (at the average rate of exchange equal to 4 s.).

CANADA BALSAM—CANAJOHARIE.

The English imperial yard, pound avoirdupois, and gallon are standards for C.; but in 1859 the hundredweight of 112 lbs. and the ton of 2240 lbs. were abolished, a hundredweight of 100 lbs. and a ton of 2000 lbs. being substituted.

For the various provinces and towns of the Dominion, see their titles.

CANADA BALSAM: a kind of turpentine (q.v.) obtained from the Balm of Gilead Fir (*Abies* or *Pinus balsamea*), a native of Canada and the n. parts of the United States: see FIR. It exists in the tree in vesicles between the bark and the wood, and is obtained by making incisions, and attaching bottles for it to flow into. It is a transparent liquid, almost colorless, and with an agreeable odor and acrid taste. It pours readily out of a vessel or bottle, and shortly dries up, and becomes solid. When fresh, it is of the consistence of thin honey, but becomes viscid, and at last solid by age. It consists mainly of a resin dissolved in an essential oil, and its composition is as follows:

Essential oil.....	24.0
Resin, soluble in boiling alcohol.....	60.0
Resin, soluble only in ether.....	16.0
	<hr/> 100.0

It is the finest kind of turpentine obtained from any of the *Coniferæ*. Once it was valued in medicine, particularly as a stimulant for the cure of mucous discharges, and as a detergent application to ulcers. It has also a variety of uses in the arts—as an ingredient in varnishes, in mounting objects for the microscope, in photography (q.v.), and by opticians as a cement, particularly for connecting the parts of achromatic lenses to the exclusion of moisture and dust. Its value for optical purposes is very great, not only from its perfect transparency, but also from its refractive power, which is nearly equal to that of glass. See BALSAM.

CANADA GOOSE: see GOOSE.

CANADIAN, a. *kă-nā'dī-ăn*: of or from Canada: N. a native or inhabitant of. **CANADA BALSAM**, a pure transparent resin obtained from *Abies balsam'ëä*. **CANADA-RICE**, n. a grass, *Zizania aquatica*. **CANADA-TEA**, a plant, *Gaultheria procumbens*. It belongs to the Heath family.

CANAILLE, n. *kă-nāl'* [F. *canaille*, the mob—from It. *canaglia*, the rabble]: the lowest people; the rabble.

CANAJOHARIE, *kăn-a-jo-hăr're*: village and township of Montgomery co., N. Y., on the s. bank of Mohawk river, 55 m. w.n.w. of Albany; opposite Palatine Bridge, a station on N. Y. Central railroad. The Erie canal passes through it. The village, incorporated 1829, has 5 churches, an academy, a weekly paper, 2 banks, 2 malt-houses, a paper-bag factory, and a planing-mill. The township has 6 more churches, another academy, 6 cheese factories, and a woolen mill. There are stone quarries in the neighborhood. Pop. (1900) 2,101.

CANAL.

CANAL, n. *kǎ-nǎl'* [F. *canal*, a channel, a furrow—from L. *canālis*; It. *canale*, a pipe for water, a channel; Dut. *kanaal*, a channel; may be connected with L. *canna*, a pipe or reed]: a water-course navigable for boats or ships; an artificial river; in *anat.*, a duct or tube in the body for the passage of fluids.

CANALS, as artificial channels for water, for purposes of drainage, irrigation, or navigation, are in the present usage of the term usually such as are intended for the passage of vessels.*

Canals date from long before the Christian era, and were made for irrigation and communication by Assyrians, Egyptians, and Hindus; also by the Chinese, whose works of this kind are said to be unrivalled in extent; one of them, the Imperial C., having a length of about 1,000 m. For the most part, however, these early canals were of one uniform level, and hence required no great skill or ingenuity; and the moderns were content to follow the rudimentary efforts of the ancients in this way until the 15th c., when the invention of the lock (q.v.) made it possible to apply canals to countries whose surface was irregular. The Italians and Dutch, for both of which nations the invention of the lock has been claimed, were the first to develop this kind of engineering in Europe. In France, the first C., that of De Briare, to form a communication between the Loire and the Seine, was opened 1642. In 1681 was completed the greatest undertaking of the kind on the European continent, the C. of Languedoc, or the C. du Midi, to connect the Atlantic with the Mediterranean. The length of this C. is 148 m., it has more than 100 locks, and about 50 aqueducts, and in its highest part it is 600 ft. above the sea. It is navigable for vessels of upward of 100 tons. It was not until nearly a century later that C. navigation assumed importance in England, through the sagacity, energy, and liberality of the Duke of Bridgewater (q.v.), and his celebrated engineer, James Brindley (q.v.). The success of these works stimulated similar undertakings. Speculation in C. shares became a mania similar to that which later excited the people in connection with railways, and a crash ensued on the prospect of war in 1792. Britain speedily became intersected with these watery highways to an extent unequalled in any European country save Holland.

Canals may be divided into three general heads—1. Canals proper, i.e., entirely artificial channels, having no water running through them beyond what is necessary for their own purpose; 2. Tidal, i.e., affected by the rise and fall of the tides; and 3. Rivers rendered navigable by weirs built across them to increase their depth, and hav-

* In the fen-districts of the e. coast of England, however, the large channels required for drainage are made subservient to purposes of inland navigation by sluices at the mouth—one to keep out the tide at high water, and another acting in the opposite direction, to retain water of depth sufficient in the channel to float such boats as make use of it. These combinations of drain and canal are commonly called *navigations*; hence the workmen employed in their construction were called *navigators*, which, contracted into *navvy*, is now applied in Britain indiscriminately to persons engaged in any kind of earth-works.

CANAL.

ing a lock at one end for the ascent or descent of vessels; and occasionally, when there is much fall, or any formidable obstruction in the river, by lateral cuts, with locks for part of their course.

Another division may be made (1) of ship-canal for the transit of sea-going vessels generally, from sea to sea; these are necessarily of large dimensions, and must be crossed by swing or drawbridges, and (2) of canals for the passage of mere boats or barges generally without masts, so that they may be crossed by stone or other solid bridges. The largest ship C. in Europe is the Great North Holland C., completed 1825, which has a breadth of 125 ft. at the water-surface, and 31 ft. at the bottom, with a depth of 20 ft. It extends from Amsterdam to the Helder, 51 m.; it thus enables ships of 1,400 tons to avoid the shoals of the Zuyder Zee. The surface of the water in this C. is below the high-water level of the German ocean, from which it is protected by embankments faced with wicker-work. The locks on this C. are 297 ft. long, 51 ft. broad, 20 ft. deep. There is a similar C. from near Rotterdam to Helvoetsluis, to avoid the shallows of the Brill at the mouth of the Maas. Another great ship C. is the Caledonian C. (q.v.). The Forth and Clyde C. is also for sea-going vessels, but on a smaller scale. Its length is 35 m.; its medium width 56 ft. at the surface, 27 ft. at the bottom, and its depth 9 ft. It has 39 locks, each 75 ft. long, 20 ft. wide, and a rise of 155 ft. For ship-canal, it is important to secure a sheltered entrance, one not likely to become silted up, and of sufficient depth to admit vessels at all times of the tide; and towing-paths on both sides are desirable.

Among principal canals in England for barges, some of which run to very great elevation, are the—

	Length, Miles.	Rise, Feet.
Grand Junction...	128	...
Leeds and Liverpool.....	128	433
Trent and Mersey.....	93	326
Kennet and Avon.....	57	402

The C. of the Loire is one of those aiding the navigation of a river. It has a width on the water-line of 33 ft., depth of 5½ ft., the locks being 17 ft. broad, and 100 ft. long. The river Lea and the Mersey and Irwell Navigations in England; and the Welland C. in Canada, formed to connect Lake Erie with Lake Ontario, and avoid the Falls of Niagara, are among noteworthy works of this class; the river Thames, above the first lock at Twickenham, partakes also of the nature of a canal.

Many canals pass through long tunnels, some very low and without towing-paths, in which case the mode of propulsion is by the boatmen lying on their backs and pushing with their feet against the roof of the tunnel.

The great expenditure of water and time in 'locking' have led to the trial of various other plans for overcoming differences in level. On the Great Western C., England, boats are raised and lowered by means of machinery, called a perpendicular lift. On the Morris C., New Jersey,

CANALETTO.

boats are conveyed on a carriage up a railway inclined plane, from one reach to another, though it is expected that this C. will soon be abandoned, on account of increase in railway facilities: on the Chard C., Somersetshire, England, and on the Monkland C. near Glasgow, boats are taken afloat in a caisson, or water-tight vessel, up or down an inclined plane—in the latter case, empty boats of 60 tons burden are raised or lowered 96 feet.

Among the problems of canal engineering are the securing of an ample supply of water, to the summit-level; by feeders and reservoirs, stop-gates at convenient distances, to shut off the water sections in case of damage to any part of the C.; means of drainage when repairs are necessary; and provision by puddling or otherwise against leakage through the banks. The floor-line or bottom of a C. is usually made twice the width of the largest boat likely to enter the C., with an addition of 6 or 8 inches for play at each side, and the depth 12 or 18 inches more than the draught of the boat.

The introduction of railways has materially interfered with C. traffic, and some canals have been altogether abandoned. It is estimated that the inland boat navigation constructed in Great Britain exceeds 4,700 m. In the United States there are upward of 4,000 miles of C., of which 1,300 m. are in New York state. The C. system has been extensively carried out in France. A new canal, which shortens the distance from Amsterdam to the North Sea to 15 m., has recently been completed. The harbor is near Wyk-aan-Zee, and the minimum width is to be 80 yards. This canal was constructed mainly by British capital and engineers.

In 1883, a canal across the Isthmus of Corinth was begun; and M. Lesseps' canal across Panama was in progress. See SUEZ: SUEZ CANAL: INTEROCEANIC SHIP CANAL.

Injuries to canals are punishable at law by severe penalties. See CARRIERS.

In the U. S. railroads are so extensive that canals are comparatively of little value for commercial purposes. In 1902 the prin. canals were Erie and Sault Ste. Marie. The former cost \$52,540,800; in 1903, N. Y. legis. voted \$101,000 more for imp., subject to referendum. Latter, at Sault Ste. Marie, Mich., is noted for its vast tonnage. In 1901, 15,837 vessels passed through it, with a reg. tonnage of 21,865,144 tons; freight tonnage of 25,026,522 tons.

CANALETTO, *kâ-nâ-lèt'to*, or **CANALE**, *kâ-nâ'lâ*, **ANTONIO**: 1697–1768; b. Venice; son and pupil of a theatrical decorator. He studied at Rome. He painted a numerous series of excellent views in Venice, among which those of the great canal are especially admirable for their fresh coloring, faithfulness, and the invention of accessory objects. He came to England by the advice of Amiconai, and acquired wealth and fame by his representations of English scenes, several of which are in Buckingham House, and are highly admired.

CANALETTO, or **CANALE**, **BERNARDO BELLOTTO**:

CANALICULUS—CANARA.

1724-80; b. Venice; nephew and pupil of Antonio C.: attained high excellence as painter, and also as engraver on copper. He practiced his art in his native place, afterward in Rome, Verona, Brescia, Milan, and Dresden. Correct perspective, powerful effects of light and shade, and beautiful sky-tints, are prominent characteristics of his works. C. visited England, where, among several other excellent works, he painted a masterly interior view of King's College Chapel, Cambridge. He died in Warsaw.

CANALICULUS, n. *kăn'ă-lîk'û-lûs*, CAN'ALIC'ULI, n. plu. *-lîk'û-lî* [L. *canālic'ulus*, a water-channel—from *canālis*, a pipe, a channel]: a term applied to minute passages, such as the minute canals of bone; also to the passages which carry away the tears. CANALICULATE, a. *kăn'ă-lîk'û-lât*, channelled; having longitudinal grooves or furrows.

CANAMINA, *kâ-nâ-mē'nâ*: town of Dahomey, Africa, about 12 m. s. of the capital, Abomey; in the midst of a cultivated plain, and has a house for the accommodation of white men, set apart by the king. Pop. 10,006.

CANANDAIGUA, *kăn-an-dă'gwa*: cap. of Ontario co., N. Y., at the n. end of C. lake, 28 m. s.e. of Rochester, 15 m. w. of Geneva; on the Auburn branch of N. Y. Central railroad, and on the Rochester and Elmira branch; 12 m. s. of the Erie canal at Palmyra. It is a very attractive village and a place of resort, finely situated on high ground, and commanding a beautiful view of the lake. The Indian name, *Canandarqua*, signified 'chosen spot,' or 'town set off.' It has 7 churches, an academy, a girls' school, a library assoc. and museum, 2 weekly papers, 2 orphan asylums, a lunatic asylum, a fine court-house built in part by the U. S. govt., and many handsome private residences. Pop. (1880) 5,726; (1890) 5,868; (1900) 6,151.

CANANDAIGUA LAKE: in Ontario co., N. Y.; length 15 m., average width, somewhat over 1 m. It is fed by a few small streams; its waters are discharged by the Clyde, Seneca, and Oswego rivers, into Lake Ontario, than which it is 437 ft. higher, being 668 ft. above the sea. Its banks are high, and the surrounding country fertile and well cultivated. Steamers ply upon it daily during the season.

CANANORE, *kân-a-nôr'*: seaport and military station of the dist. of Malabar, in the presidency of Madras; lat. 11° 52' n., long. 75° 26' e.; about 50 m. n. of Calicut. The town stands at the head of a bay, which opening from the s., forms its harbor, while the fort and cantonments occupy the bluff headland, which shelters the inlet on the side of the Arabian Sea. Besides pepper, grain, and timber, the neighborhood produces immense quantities of cocoa-nuts, largely exported to the n., where they are said to be scarce. C. has been a British possession since 1791, having in that year been taken from Tippoo Sultan. Pop. (1891) 27,418.

CANARA, *kâ-nâ'râ*: region on the w. coast of the Indian peninsula, comprising two British collectorates.—NORTH C., called also *Honavar*, the most southerly portion of the Bombay province, is like the other districts on the coast southward, exceedingly fertile; 3,911 sq.m.; pop. about

CANARAC—CANARIES.

421,840.—SOUTH C., a narrow strip of hilly and very fertile country, is in the Malabar like the preceding, but is comprised for administrative purposes in the province of Madras. It is called sometimes *Mangalore*, from its chief town. Area, 3,902 sq. m., pop. about 1,000,000.

CANARAC, *kā-nā-rāk'*: town on the Orissa coast at the n.w. angle of the Bay of Bengal; lat. $19^{\circ} 54'$ n., long. $86^{\circ} 10'$ e.; 235 m. s.w. of Calcutta. It is remarkable chiefly for the remains in its vicinity of a colossal pagoda. The entire area, a square of about 13 acres, is said to have been surrounded by walls 150 cubits high and 19 broad; and the principal materials appear to have been red granite and black basalt, some of the blocks measuring 15 or 16 ft. in length, by 6 or 8 ft. in width, and 2 or 3 ft. in thickness. Most of the sculptured embellishments have been removed to the temple of Juggernaut, which is in the same district of Pooree as C. itself.

CANARD, n. *kă-nârd'* [F. *canard*, a duck, a drake]: a story got up to gull the public; a hoax.

CANARIES, *ka-nâ'rēz*, or CANARY ISLANDS, *ka-nâ'rē*: group of islands belonging to Spain, in the Atlantic Ocean, off the n.w. coast of Africa; lat. $27^{\circ} 40'$ — $29^{\circ} 25'$ n., long. $13^{\circ} 25'$ — $18^{\circ} 16'$ w.; forming a Spanish province. The group consists of seven large and several small islets: total about 3,800 sq. m.; pop. (1900) 358,564. The principal islands proceeding from e. to w., are Lanzarote, Fuerteventura, Gran Canaria, Tenerife, Gomera, Palma, and Hierro or Ferro. The coasts are steep and rocky, and the surface is diversified with lofty mountains (the greatest elevation being attained in the *Pico de Teyde*, in the island of Tenerife, 12,182 ft.), narrow gorges, and fertile valleys. All the islands are of volcanic origin. On the summits of the highest elevations, depressions, like those left by fallen cones of volcanoes, are almost everywhere found; and the steep declivities are marked by deep fissures, of which, usually, only one penetrates the depressed summit, and exposes to view the several strata of the volcanic rock. There are numerous torrents, but no rivers, and fresh water is very scarce in the s. parts of the islands, and especially in Hierro.

The researches of Humboldt and Von Buch led to the division of the botanical geography of Tenerife into five distinct regions. The first, or region of African forms of vegetation, extends to about 1,300 ft. above the sea, and is marked by the growth of the date palm, sugar-cane, dragon's-blood tree, etc. The second region extends to the height of 2,800 ft., and produces vines, corn, maize, olives, chestnuts, etc., in luxuriance. This zone represents the vegetation of s. Europe. In the third region, about 1,200 ft. higher, are laurels and evergreens. In the fourth, extending to above 6,000 ft., vegetation is nipped by cold and excessive dryness, snow falling several months of the year, and only the *Pinus Canariensis* and other *Coniferæ* flourishing. The fifth region attains an elevation of nearly 11,000 ft. Here are found a kind of *Spartium* (Broom) peculiar

CANARIES.

to this zone, with cedrine junipers, and one Alpine plant, *Arabis alpina*. The barren mountain-peaks are just below the limit of perpetual snow, although in a cavern 11,000 ft. above the sea, snow is said to remain throughout the year. All the rest of the islands are similar in character, with the exception of Fuerteventura and Lanzarote, which are less elevated, more abundantly wooded, and more luxuriant in vegetation generally.

Minerals are few, and of little importance. Near the sea, the general temperature ranges from 60°—66° F. in Jan., to 78°—87° F., in Oct. The rainy season lasts from Nov. to Feb.; from Apr. to Oct., the weather is uniformly fair. The islands, however, suffer much from the e. and s.e. winds, which, blowing over the hot deserts of Africa, burn up vegetation, and generate disease. For a time the famous wine-produce of the island was almost annihilated by disease in the vines; and as cochineal, before the development of aniline dyes, was worth over a dollar a pound, the cactus on which the cochineal insect feeds soon covered a great part of the area formerly devoted to vineyards. Cochineal having fallen to 16 or 20 cents a pound, the culture of the vine is again attended to with care; and tobacco, coffee, sugar, fruits, and other crops, for which the soil and climate of the various islands are suitable, were in 1884 being increasingly grown.

TENERIFE, the largest island of the group, has 877 sq. m.; pop. 112,000. In the n. w. of this island, principal seat of the cochineal cultivation, is the famous Pico de Teyde, or Peak of Tenerife (q. v.). The chief town and port is Santa Cruz de Santiago (q. v.), on the n.e. coast.

GRAN CANARIA, next in importance, has 758 sq. m.; pop. 80,000. Its culminating peak is El Cumbre, 6,648 ft. The capital, Las Palmas (q. v.), on the east coast, is the largest town of the archipelago.

PALMA has 718 sq. m.; pop. 36,000. Its highest peak, Pico de los Muchachos, has an elevation of more than 7,600 ft.; capital, Santa Cruz des las Palmas (q. v.), on the e. coast.

The area and pop. of the other islands are as follows: LANZAROTE, 323 sq. m., pop. 19,000; FUERTEVENTURA, 326 sq. m., pop. 15,000; GOMERA, 169 sq. m., pop. 13,000; HI-ERRO, 82 sq. m., pop. 5,000. The chief towns of these islands are small.

Formerly the first meridian of long. passed through Hierro.

The C. are supposed to have been the Fortunate Islands of the ancients. The Carthaginians are said to have visited them, and Juba II., king of the two Mauritanias, wrote an account of them that has been transmitted by Pliny. In modern times the first account of them was furnished in the first half of the 14th c., by the crew of a vessel that had been driven among them by stress of weather. A Spanish gentleman obtained a grant of them from the pope; but when an attempt at settlement was made, the Spaniards were driven off by the natives. In the beginning of the 15th c., the Spaniards succeeded in obtaining a footing; but a difference having arisen with Portugal concerning them,

CANARIS—CANARY.

it was not until 1493 that the authority of Spain was finally established. Since that time, they have remained attached to the Spanish crown. The Guanches, a brave and intelligent race, the aborigines of the islands, have long ceased to exist as a separate people, the population being now quite Spanish.

CANARIS, or KANARIS, *kā'nā-rīs*, CONSTANTINE: abt. 1790–1877, Sep.; b. on the island of Ipsara: Greek patriot. As captain of a merchant vessel he inflicted great damage on the Turks by means of fireships at Scio and Tenedos, 1822, and preserved the Greek fleet. He won a victory near Mycale 1824, Aug. 17, saving Samos from destruction. 1825, Aug. 4, he attempted to burn the Turkish fleet at Alexandria, but was baffled by contrary winds. C. held various offices under Capo d'Istria and King Otho, but took offense at the Bavarian despotism, resigned his posts and orders, and refused, 1861, a pension of 12,000 francs and the title of vice-admiral. He became prime minister 1862, took part in bringing Prince George of Denmark to the throne 1863, and was minister of marine and pres. of the council 1864–5. He died at Athens.

CANARIUM, *kan-ār'ī-ūm*: genus of trees of the nat. ord. *Amyridaceæ*, natives the s.e. parts of Asia, the Malayan archipelago, etc. The fruit is a drupe. The kernel of the fruit of *C. commune* is eaten both raw and roasted; and in Amboyna, bread is made of it, usually in the form of rolls about a yard long and an inch thick. An oil is expressed from it, which is used for the table and for lamps. The tree is about 50 ft. high. *C. sylvestre* also produces eatable kernels. *C. commune* is supposed to be one of the trees which yield ELEMI (q.v.), and *C. microcarpum* yields an oil very like copaiva, known in ship-building yards as DAMAR (q.v.).

CANARY, n. *kā-nā-rī* [F. *canari*; OF. *canaries*, a bird from the *Canary* Islands]: a wine from the *Canary* Islands; a fine song-bird of yellowish plumage. CANARY-SEED, the grain of *Phal'āris canārien'sis*, ord. *Gramin'ēæ*, much used as food for small domesticated birds. CANARY-WOOD, n. the timber of *Persea indica* and *P. canariensis*, from S. America. It is a sound, light, orange-colored wood, used for cabinet work, musketry, and turning.

CANARY, *ka-nā-rī*, or CANARY BIRD: beautiful little bird, very common as a cage-bird, esteemed for its musical powers. It is one of the numerous family of finches (*Fringillidæ*), and is *Fringilla Canaria* of Linnaeus. Some modern ornithologists place it in the genus *Carduelis*, others in *Linota*; it is, indeed, intermediate between these genera, the goldfinches and the linnets. Some make it the type of a genus or sub-genus, *Canaria*. It is found in Madeira, the *Canary* Isles, and the *Cape Verd* Isles; frequents the neighborhood of human habitations; builds its nest of moss, feathers, hair, etc., in thick, bushy, high shrubs or trees; and produces four, five, or even six broods in a season. In its wild state, its plumage is greenish, or greenish-yellow,

CANARY GRASS.

sometimes tinged with brown, and exhibits less variety and beauty than in domestication. It was brought to Europe in the beginning of the 16th c. It breeds readily in confinement, and seems thoroughly reconciled to its cage-life; but although canaries of long domesticated races sometimes excel in imitative powers and acquired strains, yet



Canary.

they are surpassed in loudness and clearness of note by some of the wild birds, which, when caught and imported, are occasionally sold for extraordinary prices. Even in confinement, the C. often breeds four or five times a year, laying from four to six eggs each time. The eggs are pale-blue. The male assists the female in building the nest and in feeding the young. Besides seeds of various kinds, which are their principal food, canaries are very fond of bland green leaves, such as those of chick-weed, a supply of which is necessary for their health; and one of their favorite luxuries is sugar. The C. frequently lives 15 or 16 years. It can be taught various notes and airs, and some even learn to articulate words. The rearing and training of canaries afford occupation to many persons, particularly in the Tyrol. The C. hybridizes readily with some other species of finch, producing 'males,' some kinds of which are valued as song birds.—There are several species very closely allied to the C., one of which, a beautiful little bird, entirely yellow, with an orange crown, a native of Brazil, is sometimes sold as a song-bird, but its musical powers are very inferior to those of the common species.

CANARY GRASS(*Phalaris Canariensis*): grass, of which the seed is much used, under the name of *canary-seed*, as food for cage-birds, and on that account, cultivated to some extent. It is a native of the Canary Islands naturalized in the s. of Europe, and in some places in Britain, Germany, and other countries. The seed is sown early, generally in Feb., yet the crop is not reaped till after the ordinary grain harvest.—This grass attains a height of two or three ft., and has a crowded, egg-shaped, spike-like panicle from an inch to almost two inches long; the spike-

CANARY PLANT—CANARY WINE.

lets are one-flowered, very much laterally compressed, a rudimentary scale-like floret on each side of the perfect floret; the *glumes* winged on the keel, and with two strips of darker green on each side; the *paleæ* awnless, shining, and at last firmly inclosing the seed. A fine flour is prepared from canary-seed, which is employed as dressing in fine cotton-weaving, and for the finishing of silken stuffs. The groats and flour of this small kind of grain are used in the Canary Islands, in Barbary and in Italy, as food also, the flour being made into very nutritious and pleasant bread. —Other closely allied species of *Phalaris* produce a similar



Canary Grass.

grain, but are inferior in productiveness and quality.—A grass, now generally referred to this genus, and called sometimes REED C. G. (*Phalaris arundinacea*), is very common on the banks of lakes and rivers, and in other wet places in Britain, and throughout s. and central Europe. It differs very much in appearance from C. G., having a large spreading panicle, generally of a reddish color; and the glumes are not winged at the keel. It is a somewhat reed-like grass, 4–6 ft. high, with creeping roots, which help to secure river-banks; and yields a great bulk of hay, but has been very generally despised as a coarse grass, fit only for littering cattle. The justice of this opinion has, however been called in question, and the grass declared to be very nutritious, and sufficiently acceptable both to horses and oxen when cut early. It may be mown twice a year. A variety with curiously striped leaves is well known in gardens, as *Ribbon Grass*, *Gardeners' Garters*, or *Ladies' Traces*.

CANARY PLANT: see TROPÆOLUM.

CANARY WINE, known also as TENERIFE: product of the Canary Islands, and resembles Madeira; but the name is properly applied only to the Bidogne wine, which is dis-

CANASTER—CANCELLARIA.

tinnet from the Malvoisie of the Canaries. The former is made from grapes gathered before they have ripened, and, when new, is crude and unpleasant; but in the course of two or three years, increasing in mildness as in age, becomes so much like Madeira, that it is often sold for it. Like Madeira, it is greatly improved by a voyage to the tropics. It is produced chiefly on the island of Tenerife, and the trade in the wine is mostly carried on at the chief port of this island. The Canary of the island of Palma is inferior to Tenerife, but may be consumed sooner, and has a pleasant flavor.

CANASTER, *ka-nās'tēr* [see CANISTER]: a rush-basket in which tobacco is placed in Spanish America; hence is said to be derived the name canaster, now applied to tobacco of a certain kind.

CAN-BUOY, or CONE-BUOY, n. -*bwóí*: a small buoy having the shape of a cone, employed to mark out shoals and rocks.

CANBY, *kǎn'bǐ*, EDWARD RICHARD SPRIGG, LL.D.: 1819-73, Apr. 11; b. Kentucky; gen. U.S.A. He graduated at West Point 1839, and served in Florida and in the Mexican war, receiving two brevets for gallantry. In 1861-2 he commanded at Fort Craig, New Mexico, and was made brig.gen. of vols. for a battle at Valverde, which was followed by another at Peralta. He was sent to New York 1863, July, to suppress the draft riots; commanded the div. of w. Mississippi 1864, and 1865 captured Mobile and received the surrender of the armies of Gens. R. Taylor and E. K. Smith. He was twice thanked by Pres. Lincoln, commissioned maj.gen. of vols. 1864, May 7, and brig.gen. in the regular army 1866, July 28. C. was much consulted by the sec. of war, and often employed on special duties. He took command of the dept. of the Columbia 1869, and was endeavoring to settle the difficulty with the Modocs in n. California, and negotiate for their removal from their stronghold in the rocks, when he was treacherously killed under a flag of truce by 'Captain Jack,' a chief, in Siskiyou co., California.

CANCAN, *kǎn'kǎn*: a sort of wild disreputable dance, practiced at some of the lower resorts for amusement in Paris.

CANCEL, v. *kǎn'sĕl* [L. *cancellāre*, to make like lattice-work—from *cancel'li*, a grating: F. *canceller*, to erase]: to deface writing by crossing it; to annul; to destroy: N. anything annulled. CAN'CELLING, imp. CAN'CELLED, pp. -*sĕld*. CAN'CELLA'TED, a. -*lā'tĕd* [L. *cancelli*, a grating of bars, lattice-work, marked with cross lines. CANCEL'ATE, a. -*sĕl'lāt*, lattice-like; consisting of a network of veins. CAN'CELLA'TION, n. -*lā'shŭn*, the act of defacing by crossing with lines.—SYN. of 'cancel': to abolish; efface; obliterate; erase; deface; annul; expunge; repeal; revoke; abrogate; destroy.

CANCELLARIA, *kǎn-sĕl-lār'ĭ-a*: genus of mollusks—class *Gasteropoda* (q.v.), order *Pectin'branchiata*—with

CANCELLI—CANCELLING OF DEEDS.

univalve shells, regarded sometimes as belonging to the family *Volutidæ*, or Volute Shells (q.v.), but now generally placed among *Buccinidæ*, or Whelks (q.v.). The spire is prominent, the last whorl ventricose, the surface reticulated, the mouth large, the columella plaited. All the recent species are natives of tropical or subtropical seas, and are found chiefly on sandy bottoms, at the depth of a few fathoms. The fossil species, amounting to 19, occur in the newer strata from the chalk upward.

CANCELLI, n. plu. *kǎn-sě'l' lī* or *kǎn-tshě'l' lē* [*L. cancelli*, a lattice, railings]: a fence of rails in a church separating the priests from the people; the small latticed windows of the confessional separating the priest from the penitent; a place railed off for a choir, a tribunal, etc.; in *anat.*, the lattice-like texture of the internal bone. CANCELLOUS, a. *kǎn-sě'l' ūs*, net-like or honey-combed, as the internal substance of a long bone.

CAN'CELLING OF DEEDS and WILLS. The court of chancery in England, and in the United States such courts as have chancery powers, give relief against the effect of improper cancellation; on the other hand, the court may order a deed which has been improperly obtained to be delivered up in order to be cancelled. But mere cancellation of a properly executed and delivered deed does not of itself void the grantee's title. Where a deed is cancelled by consent of the parties to it, it is thereby destroyed as to their interest under it, but third parties may still produce it in evidence. As to a will, its cancellation may have the effect of revoking it, if done with such intention.

In the United States, the law usually is that a *will* can be cancelled only by the 'testator himself, or in his presence and by his direction and consent.' It appears that where a testator has prescribed certain forms for the authentication of his will, and such forms have either not been observed by him, or if observed, have, in some essential particular, been negatived by obliteration, an intention to revoke will be presumed. A will, however mutilated or cancelled by a testator during his insanity, would be good; and of course there is no effectual cancellation when done by a third party without sufficient authority. But all such considerations are questions of evidence. See DEED: WILL.

CANCER.

CANCER, n. *kăn'sér* [L. *cancer*, a crab, an eating sore: AS. *cancre*: It. *canero*: F. *chancre*]: a spreading sore on the body or in some internal part, very painful and very fatal; a crab; one of the signs of the zodiac. CAN'CERATE, v. -*ăt*, to grow into a cancer. CAN'CERATING, imp. CAN'CERATED, pp. CAN'CERA'TION, n. -*ă'shŭn*. CAN'CEROUS, a. -*sér-ŭs*, like a cancer. CAN'CEROUSLY, ad. -*lŭ*. CAN'CEROUSNESS, n. CANCRIFORM, a. *kăng'krŭ-fawrm* [L. *forma*, shape]: cancerous; having the form of a cancer or crab. CAN'CRINE, a. -*krŭn*, having the qualities of a crab. CAN'CROID, a. -*kroyd* [Gr. *eidos*, form]: pertaining to a crab; cancer-like. TROPIC OF CANCER, that parallel in the northern hemisphere whose latitude is equal to the sun's greatest declination, about 23° 28': see TROPICS.

CANCER, *kăn'sér*: a disease characterized by slow alterations of structure, or tumors in various parts of the body, occurring either simultaneously or in a certain order of succession. In many cases, an isolated tumor in an external part is the earliest symptom; it is then viewed as the starting-point of the disease, and is termed a *malignant tumor* (*tumor mali moris*), from its presumed tendency to infect the system, and to cause the reproduction of growths similar to itself. It is right, however, to remark, that upon the pathology of C. authorities are by no means agreed, some holding that a constitutional taint or *diathesis* must always precede any local development of C., and that the first growth in point of time (or primary C.) is therefore only the first of a series determined by a pre-existing cause in the blood or general system; while others hold that C. is originally a truly local disease, or even that a growth at first simple (*non-malignant* or *benign*), may, in consequence of local causes, *degenerate*—i.e., become cancerous, and infect the whole system with the morbid tendency thus secondarily acquired. The discussion of this question involves scientific reasoning and complicated statements; yet it has considerable importance, as bearing on the probability or improbability of curing the disease by extirpating the primary tumor at an early stage. All authorities are agreed that, when any trace of secondary C. exists, the removal of the parts affected gives scarcely any hope of a favorable result; accordingly, operations under these circumstances, unless merely for the relief of local suffering, are discountenanced by all respectable surgeons. The disease, however, is one of which the ignorant as well as the learned have a well-founded dread; hence it presents a large field for the practice of imposture, and for that less deliberate, but often not less hurtful kind of quackery which is the result of ignorance, mingled with a meddlesome desire to do good.

The leading character of C. being a tumor or morbid growth in a part, it is important, in the first place, to observe that not all, nor even the majority, of morbid growths are cancerous. A very large proportion of growths, involving swelling or change of structure in a part, are either determined by a previous process of inflammation—leading to chronic abscess and induration—

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or belong to what is called the non-malignant order of tumors—e.g., cysts, fatty and fibrous tumors, simple hypertrophy of glandular structures, cartilaginous, bony, calcareous, and vascular growths: see TUMORS. Further, among the tumors admitted by general consent into the order of cancerous, there are widely different degrees of *malignancy* or *cancerousness*, so to speak; some having the tendency to spread rapidly, and infect the system at an early period, while others remain local for a considerable time, and may be removed while yet local, with good hope of a permanent recovery.

Now, the practical distinction, or *diagnosis*, to use the technical phrase, of these different tumors, is founded upon a very careful and delicate appreciation of the characters of the malignant and non-malignant tumors, considered as morbid products, and also upon a thorough knowledge of the anatomy and relations of the textures in which they arise. One of the leading characters of malignant tumors is the tendency to involve, by a kind of specific destruction or degeneration, the ultimate elements of the textures in which they arise, and in which they spread. The attempt, therefore, to distinguish these from other growths must always call for the highest qualities of the surgeon—large experience, guided at every step by a consummate science, and, in particular, by minute and thorough knowledge of natural structure. And the difficulties of the inquiry are such, that even in the dead body, or in a tumor excised from the living body, all the resources of the anatomist, aided by the microscope, will occasionally fail in distinctly and surely discovering the true character of the morbid structure.

The most common seats of C. are, among external parts, the female breast, the eye, the tongue, the lip, the male genital organs, and the bones; among internal organs, the liver, stomach, uterus, rectum, gullet, peritoneum, and lymphatic glands. Some of these parts are more liable to primary, others to secondary cancer. Thus the female breast, the neck of the uterus, the lower lip, the scrotum, the extremity of the penis, are often the seats of a single cancerous tumor, which in its early stage at least seems unconnected with any constitutional taint; while the liver, the bones, and the lymphatic glands are more frequently the seats of secondary or multiple cancerous tumors. There are also differences in the character of the C. itself, apart from its anatomical seat, which are to be taken into account in estimating the probability of its being solitary. Some of these differences are regarded by pathologists as amounting almost to specific distinctions; thus, *scirrhus*, or hard C., observed most frequently in the breast, uterus, and stomach, is more frequently solitary than *encephaloid* (brain-like), otherwise called *medullary*, or soft C.; again, *melanosis*, or *melanic C.*, a variety charged with a brown or black pigment, is almost always multiple in its occurrence; while *epithelial C.*, or *epithelioma*, as it has been recently termed, of which examples are frequently found in the lip, scrotum, penis, or tongue, is so generally solitary

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as to have led some pathologists to place it in a class altogether apart from the truly cancerous growths, with which, however, it presents too many points of affinity in its fatal tendency to recur after operation, and to infect the lymphatic glands and other structures adjoining the part primarily affected. Again, there are certain varieties of fibrous and of cartilaginous tumor, as well as certain tumors of bone, and bone-like tumors developed in soft parts (osteoid), which must be regarded, in the meantime, as occupying a doubtful position between the malignant and non-malignant growths. (Paget, *Lectures on Surgical Pathology*, vol. ii.).

Generally speaking, a tumor may be said to fall under the suspicion of being C. when it more or less completely infiltrates the texture in which it arises, and passes from it into the surrounding textures; when it invades the lymphatic glands adjoining the part first affected; when it is attended by stinging or darting pains, or by obstinate and slowly extending ulceration, not due to pressure; when it occurs in a person having impaired health, or past the middle period of life, and is not traceable to any known cause of inflammatory disease or local irritation, nor to any other known constitutional disease, such as syphilis or scrofula. The probabilities are of course increased if the tumor be in one of the habitual seats of C., or if it be attended by evidence of disease in some internal organ known to be frequently thus affected. But it is hardly necessary to point out that the very complex elements of *diagnosis* here referred to ought to be always submitted to the scrutiny and judgment of a well-educated medical adviser, whose skill and personal character place him above suspicion, before the disease has assumed such a form as to be beyond remedy. The patient who broods in secret over a suspicion of C., or who declines to apply for advice from a fear of encountering the truth, is in all probability only cherishing the seeds of future suffering; while if, as often happens, the suspicion is unfounded, a few minutes' careful examination would suffice to remove a source of misery which otherwise would poison the mind for years, or might even tend to bring on the very disease feared.

These remarks apply still more emphatically to the misguided persons who trust to the non-professional *cancer-curer*, or to the quasi-professional specialist. The charlatan, who pretends to hold in his hands a secret remedy for this most terrible disease, will invariably be found to pronounce almost every tumor C., and every C. curable. By this indiscriminating procedure, and by the fallacious promise of a cure without an operation, many persons who have never been affected with C. at all have been persuaded to submit to the slow torture of successive cauterizations by powerful caustics, at the expense of needless mutilation and no small risk of life. In other cases truly cancerous tumors have been removed slowly and imperfectly, at the cost of frightful and protracted sufferings, only to return at the end of a few weeks; and it has been lately shown that in some notorious instances persons who

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had been reported as cured, and actually died of the disease at no long period after the supposed cure. (*Cancer and Cancer-curers*, London, 1860.)

What is really known as to the cure of C., may be stated in few words. Modern pathological researches render it probable that a complete suspension of the progress of C., sometimes, though rarely, takes place; and individual tumors are found not unfrequently to undergo partial healing, or even to become entirely metamorphosed into inert cicatrices, while others, associated with them, continue to advance. The degree of rapidity of the advance of C. is also, as we have already stated, exceedingly variable. But these observations modify only to a very slight degree the general doctrine, that C. is a disease tending to a fatal issue, and hardly, if at all, under the control of remedies, as to its ultimate result. The removal of a cancerous tumor, indeed, is still resorted to by surgeons; and there appears to be no reasonable doubt that when performed early, and in well-selected cases, it has been followed by long-continued exemption. But the occasional spontaneous arrest of such growths on the one hand, and the doubtful results of operation in a large proportion of cases on the other, have combined to render surgeons of late years more chary of the use of the knife. In aged persons, in particular, the question often resolves itself into a calculation of the chances of life, founded on a great number of conflicting data, and only to be solved by a careful attention to the state of the general health, as well as to the rate of progress of the local disease. Operations are now very rarely performed after the lymphatic glands are involved, or when there is evidence of a deteriorated constitution, or of internal disease; but sometimes great pain, or profuse and exhausting discharge from an external tumor, may justify its removal, as a palliative measure, even under these unfavorable circumstances. For the mode of removal of cancerous and other tumors, see TUMORS.

Among the lower animals, this disease is more rare; nevertheless, cases are not unfrequent, presenting the same malignant characters as those observed in the human subject. Usually manifesting itself in the form of a specific tumor of some organ or tissue, there is a tendency to the invasion of other parts of the system, and the development of a constitutional state called the cancerous cachexia. M. U. Leblanc of Paris, the best veterinary authority on this subject, has shown that the dog and cat are most frequently affected with C.; and next in frequency come the pig, ox, horse, and mule. It has not been observed in birds, reptiles, or fishes. Females are more liable to C. than males. It is hereditary, but not transmissible from animals to man, or from one animal to another. It does not disappear under the influence of remedies, but, if possible, the tumors should be excised when first seen, and if the knife fail to extirpate the malady, cauterization should be had recourse to. A relapse is almost certain; but Leblanc says there is greater chance for the patient, when a carnivorous animal, if it is kept on a strictly vegetable diet.

CANCER—CANCERUM ORIS.

CANCER, the *Crab*: fourth of the 12 constellations of the zodiac, usually represented on the globe as a crab, and denoted in works on astronomy by the sign ♋, which resembles the number 69 laid sideways. It contains, according to Flamsteed, 83 stars, of which the principal is *Acubens*, a star of the third magnitude. In the divisions of the ecliptic, the *sign* called C. occupies a place between 90° and 120° from the vernal equinox; but owing to precession, the sign and the constellation have not coincided for nearly 2,000 years. See ECLIPTIC: PRECESSION: ZODIAC. Annexed is a representation of the constellation, which is one of the least strik-



ing in the zodiac. Besides *Acubens*, it has two stars of the fourth magnitude, called by the Romans *Aselli* or the Little Asses; and a nebulous cluster of minute stars about 2° from the Asses, visible to the naked eye, and which goes by the name of *Præsepe* or the Manger.

CANCER: see **CRAW**.

CANCER ROOT, or **BEECH-DROPS** (*Epiphegus Virginiana*): parasitic plant of the nat. ord. *Orobanchæ* (q.v.), native of N. America, growing almost exclusively on the exposed roots of beech-trees. Like all the other plants of its order, it has a curious appearance, having scales instead of leaves. Its stem is branching, and produces distant alternate white flowers, streaked with purple. The whole plant is powerfully astringent; and the root is brownish, spongy, and very bitter and nauseous in taste. It has acquired, in its native country, the reputation of being a cure for cancer. All parts of the plant are used, and externally more than internally. This plant, in conjunction with white oxide of arsenic, is believed to have formed a medicine once famous under the name of *Martin's Cancer-powder*.—Another American plant of the same order, *Phelipæa biflora*, is sometimes also called C. R., and is used in the same way; and an infusion of the Common Broomrape (*Orobanche major*)—native of Britain, and of the s. of Europe, parasitic on the roots of broom, furze, and other leguminous plants, has been employed as a detergent application to foul sores.

CANCERUM ORIS, *kăn'krûm' ô'rîs*, known also as *Noma*, *Water-cancer*, and *Water-canker*: peculiar form of mortification, arising apparently from defective nutrition. The

disease seldom occurs except between the second and eleventh years, and is usually preceded by measles, remittent or intermittent fever, or some other serious disease. The following is the ordinary train of symptoms : more or less general disturbance of the system, accompanied by loss of appetite, followed by swelling of the salivary glands, and a profuse flow of saliva, which escapes from the mouth involuntarily during sleep; ulceration of the gums, which swell and become livid; looseness of the teeth; and the appearance of ash-colored spots on the gums and adjacent mucous membrane, which turn into dark-colored, sloughy sores. These sores spread rapidly by a gangrenous process, expose the bone, and finally make a large aperture in the cheek. In some cases, the entire cheek has been destroyed in a very few days. This terrible disease is rare in America and Britain; it is more frequent in some parts of continental Europe. The obvious indications of treatment are to remove the patient to pure air, to administer tonics, nourishing food, and (in moderation) stimulants; to touch the diseased parts with nitrate of silver, or glyceride of carbolic acid, and to wash out the mouth frequently with a weak solution of Condyl's fluid.

CANDACE, *kān'da-sē* : name apparently common to the warrior queens of Ethiopia, i.e., upper Nubia, between the Nile and the Atbara, in the later period of the kingdom of Meröe. The most distinguished of them invaded Egypt B.C. 22, was defeated by the Romans and obliged to sue for peace, which she obtained, with a remission of the tribute imposed on her by Petronius. One of her successors is mentioned in Acts viii. 27; her high treasurer was baptized by Philip the Deacon, on the road to Gaza.

CANDAHAR, or KANDAHAR, *kān-dā-hār'* : capital of central or s. Afghanistan : about 200 m. s.w. of Cabul: lat. 32° 37' n., long. 66° 20' e. : 3,484 ft. above the level of the sea. It is in form oblong, while all its streets run straight, and cut one another at right angles. At the point of intersection there is a large dome (*Charsu*), 50 yards in diameter. Pop. variously estimated from 25,000 to 100,000. C. is well watered by two canals drawn from a neighboring river, which send to almost every street its own adequate supply; and the same means of irrigation have covered the immediate vicinity with gardens and orchards. C. is a place of great commerce, trading with Bombay, Herat, Bokhara, Samarcand, etc. Among its permanent residents, C. has a larger proportion of Afghans, chiefly of the Dooraanee tribe, than any other city of Afghanistan. There are numerous Hindu and Persian merchants. About two m. to the northward rises a precipitous rock, crowned by a fortress impregnable to everything but heavy artillery. Here, amid all the disasters of the war 1839-41, the British held their ground. C. has been a pivot for the history of central Asia during more than 2,000 years. It is supposed to have been founded by Alexander of Macedon, owing its name, probably, to the oriental corruption of Iskender or Scander, as in Scanderoon or Iskenderun of Syria. A comparative blank of upward of 13 centuries in the history reaches to the famous Mahmoud of Ghiznee, who wrested the stronghold from the Afghans. From that epoch to 1747, when the native rule

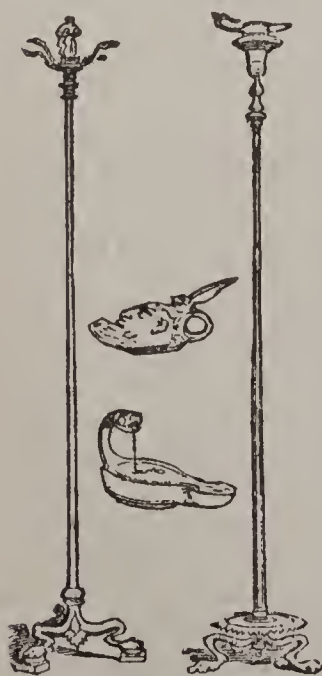
CANDAULES—CANDELABRUM.

was permanently established, C., with brief and precarious intervals of independence, was held by Tatar, India, and Persia, in turn. In the war of 1878-80, the British entered C. unopposed, and they held the city till 1881, some months after they had evacuated the rest of Afghanistan.

CANDAULES: see GYGES.

CANDEISH, or KHANDESH, *kān-dāsh'*: district in the province of Bombay; 9,944 sq. m. It lies chiefly in the basin of the middle part of the Tapti, and is bounded mostly by territories of nearly all the powerful native princes—the Nizam, Scindia, Holkar, and the Guicowar. Through its situation, it necessarily suffered much from the long contest between the Mohammedans and the Mahrattas, and from the struggles among the rival chiefs of the latter. Accordingly, when, in 1818, it fell to the East India Company on the overthrow of the Peishwa; it presented little better than a scene of desolation, with ruined mansions, dismantled towns, and dilapidated temples. The difficulties of the new government were considerably aggravated by the Bheels, a more than half-savage race, that formed about an eighth of the population; and even beasts of prey, particularly tigers, had, during the human strife, multiplied to an unusual extent. But the improvement was regular and steady. Peace and security reigned; so that roads, formerly hazardous for armed parties, became safe. The staple productions are cotton, wheat, and other grains, also a little indigo. The cultivators are generally in a progressive-condition, especially in the cotton districts, and the well-watered talooka of Baglan. Pop. (1881) 1,237,231; (1891) 1,460,851.

CANDELA, *kān-dā'lá*: town of s. Italy, province of Foggia, 22 m. s. of the town of Foggia: pleasantly situated on an eminence. The surrounding district is very fertile. Pop. of C. 6,600.



Ancient Roman
Candelabra.

CANDELABRUM, n. *kān'dě-lā'brūm*, CAN'DELA'BRA, n. plu. *-brá* [L.—from *candēla*, a candle: It. *candelabro*: F. *candélabre*]: properly, a large ornamental candlestick with branches; more frequently, a support for a lamp. There were, perhaps, no articles of furniture in which the ancients combined the beautiful with the useful to so large an extent as in their candlesticks and lamps. Candelabra usually stood on the ground or floor, and were of considerable height—from 4 to 8, or even 10 ft. The most common were of wood; but metals of all kinds, including the precious metals, were used in their construction, and sometimes they were even adorned with gems. The candelbra found at Herculaneum and Pompeii are mostly of bronze. In the temples and palaces of the emperors, they were frequently of marble, and of great size and richness.

They have usually a capacious cup at the top, either for

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the purpose of containing oil enough to feed a large flame, or that they might be used for burning incense. Though varying greatly in details, a general design runs through the forms of the candelabra of antiquity. They have all a foot or feet, a shaft, and a plinth on which a lamp is placed, or which is furnished with a socket for a candle. The base often consists of three feet of a lion, goat, griffin, or other animal real or imaginary. Sometimes a figure was



Candelabrum, with suspended Lamps.

introduced either into the body of the shaft, or placed on the top of it, in either case supporting the superincumbent portion of the C. on its head. Sometimes a figure was substituted for the shaft altogether, the receptacle for the oil being placed in one hand. In others, the shaft is a sliding one, like that of a music-stand, the object being, of course, to raise or depress the light at pleasure.

In addition to the various kinds of candelabra which, from their height, seem to have stood on the floor, the ancients had others intended to be placed on a table. These consisted either of a pillar or of a tree, and from the capital of the former, or the branches of the latter, lamps were suspended, as in the accompanying illustration, from Smith's *Dictionary of Greek and Roman Antiquities*. The C., in this instance, including the stand, is only three ft. high. From the size of the stand in proportion to the rest of the C. it seems to have been used for some additional purpose.

CANDENT, a. *kān'dent* [L. *candens*, p. pr. of *candeo*, I

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shine, I am white-hot]; in a state of greatest heat, next to fusion; white-hot; hot; impassioned.

CANDIA, *kān'de-ā*, in Turkish, 'KIRID', called in the most ancient times *Idea*, afterward *Crete*: one of the largest islands of the Mediterranean; at the entrance of the Archipelago, long. $23^{\circ} 40'$ — $26^{\circ} 40'$ e., lat. $34^{\circ} 50'$ — $35^{\circ} 55'$ n. It is very irregular in form, its length being about 160 m., and its breadth varying from 6 to 35 m. The history of C. commences with Greek mythology, and the old historians and poets say, that it was governed by its own kings, among whom were Saturn, Jupiter, and Minos, 1,300 years before Christ. C. was conquered by the Romans under Metellus, who, on that account, had the title of 'Creticus'; on the division of the empire, it fell to the share of the eastern monarchs. In A.D. 823, it was conquered by the Saracens, who built the city of C. on the ruins of Heraelea. In 1204, it was sold by Pope Boniface—to whom Baldwin I. gave it—to the Venetians. In 1645, the Turks besieged Canea, and in 1669 conquered the island, after a war, which lasted 24 years. The Cretans sigh for a union with Greece, and have repeatedly risen in insurrection against Turkish rule, notably in 1866. At the Berlin Congress, 1878, the Porte engaged scrupulously to carry out in C. the reformed system of government drawn up in 1868.

The island of C. is for the most part mountainous, the mountains chiefly of freestone or of marble, either gray or white. Toward the s. side of the w. part of the island, there is a chain of high mountains, in length about $37\frac{1}{2}$ m., which, from their appearing white, especially at their west end, were anciently called Leuci. Mount Ida, now called by the natives Upsilorites, is one in a chain of mountains extending to the n.w. of the island almost to Retimo; the mountain is of gray marble, and the surface loose stones: there is no verdure on it except a few small shrubs. In myth. Jupiter is said to have passed great part of his youth among these mountains in the exercise of hunting and drawing the bow.

The island abounds in springs and fountains, which are found even by the sea-side; most of the rivers are dry in summer, but in winter many of them are very dangerous torrents. The island does not show any minerals of importance. The soil of C. is fertile, and produces wheat in abundance. The exports, chiefly of oil, wool, linseed, and fruit, amount in annual value to above \$2,000,000, and the imports to about \$2,200,000.

The population is, for the most part, of Greek descent; there are only about 70,000 Turks, with a few Arabs and Armenians, in the island. There are, however, many Greek Moslems in C., the worldly advantages which formerly resulted from embracing Islamism having induced whole districts to abandon the faith of their forefathers; but their change of religious faith was unaccompanied by any change of language.

C. had anciently, according to Homer in his *Odyssey*, 90 cities; there are now only 3 principal towns: Megála Kástron or Candia, pop. 22,774; of which 5,000 are Christians;

Retimo or Rhithymnos, pop. 9,311; of which 2,000 are Christians; Canea (q.v.) or Khania, pop. 24,537; of which 8,000 are Christians. The population of the island now numbers less than half its amount at the outbreak of the Greek revolution, 1821; it was (1900) 303,543.

Numerous unsuccessful attempts have been made by the Cretans to throw off the Turkish yoke—in 1821, in 1858, in 1866, in 1877, and again in 1896. The immediate cause of the latest outbreak appears to have been the recall of the Christian governor Caratheodory Pasha and his replacement by a Mussulman, Turkban Pasha. On 1896, Apr. 24, there was a bloody encounter at Episkopi, in which 50 persons were killed and wounded. Massacres of Christians occurred at Canea and other places on May 24, and during the following fortnight 28 towns were burned by Turkish soldiers. By July 1, the Turkish forces had been increased from the usual 6,000 to 20,000. A concert of the six leading European Powers was brought to bear upon the Porte, resulting in Turkish and Cretan acquiescence in a plan to grant financial and judicial independence to the island under the guarantee of the Powers.

CANDID, a. *kăn'dīd* [F. *candid*, white—from L. *candidus*, white—from L. *candēre*, to shine, to be bright: It. *candido*]: white; open; sincere; frank; fair; free from malice. **CAN'DIDLY**, ad. *-lī*, without deceit or reservation; sincerely. **CAN'DIDNESS**, n. frankness and sincerity. **CAN'DIDATE**, n. *-dī-dīt* [F. *candidat*—from L. *candidātus*, clothed in white—persons in Rome seeking offices having worn a white toga without a tunic; partly in ostentation of simplicity, partly to display wounds received in battle]: a person who seeks for a vacant office; one who offers himself as a fit person to fill an appointment. **CAN'DIDATURE**, n. *-dū-tūr*, the position of a candidate for an office; a canvass. **CAN'DIDATESHIP**, n. state of being a candidate.—**SYN.** of 'candid': sincere; cordial; frank; hearty; open; ingenuous; warm; fair; impartial; just; artless; unbiassed; equitable.

CAN'DIDATE [see **CANDID**]: among anc. Romans, a person seeking a high office. The candidature commonly lasted two years: in the first year, the C. was proved by the senate, whose decision, if favorable, was ratified by the popular assemblies; and, in the second, his name was entered in the list of candidates. During this period occurred the *ambitio*, or canvassing of voters, which often gave occasion to enormous bribery, in spite of the severe enactments passed to prevent the corruption of the electors. The elected C. was styled *Designatus*.

In the early Christian church, newly baptized converts were styled **CANDIDATES**, on account of the white garments worn during eight days after baptism. In modern times a German probationer or theological student who has been approved before the highest ecclesiastical authorities, is called a Candidate.

CANDIED, *kăn'dīd*: see under **CANDY**.

CANDLE.

CANDLE, n. *kǎn'dl* [AS. *candel*; L. *candĭla*, a candle—from *candĕō*, I shine—*lit.*, a body for shining]: a round body made of tallow or any fatty matter, with a wick in the centre, used to give light; a light or luminary. **RUSH-CANDLES**, the pith of rushes dipped in tallow. **CANDLE-BOMB**, a small glass bubble filled with water, which, if placed in the flame of a candle bursts, by the expansion of steam generated from the inclosed water. **CAN'DLE-STICK**, the stand or stick for a candle. **CAN'DLEMAS**, n. *-dl-mās*, a quarterly term, Feb. 2; a feast in the Chh. of Eng. and in the Rom. Cath. Chh. in honor of the purification of the Virgin Mary—on which occasion, in the Rom. Cath. Chh. many candles are used, and those intended for use in the churches for the whole year are blessed. **NOT FIT TO HOLD A CANDLE TO**, not able to be compared with; only able to occupy a very inferior position to—referring to the inferior position of acolytes and others who hold candles in certain acts of worship in the Rom. Cath. Church.

CANDLE, *kǎn'dl*: cylinder of wax or fatty matter, with a wick, intended for giving light. Candles are made principally of tallow; also of the solid portion of palm and coconut oils, bleached wax, spermaceti, and paraffine, and other oily substances found in coal, shale, and gas-tar. They are either dipped, molded or rolled. 'Dips' are made by stretching a number of wicks upon a suitable frame, so that they may hang down at a distance from each other equal to about double the intended thickness of the C.; these are then dipped in a trough of melted tallow, and hung upon a rack until cooled, then dipped again and again, until the required thickness is obtained. The dipper has a number of frames prepared before commencing, and by the time he has dipped the last, the first is cool enough to dip again. The tallow in the trough has to be kept only a little above its melting point, for if it were much hotter, it would melt away a portion of the tallow already on the wick, instead of adding to it. Tallow candles are much improved by being kept a year or a winter before using.

Molds, or mold-candles, are cast by pouring the tallow down a pewter tube, along the axis of which the wick has been previously fixed. These tubes are well polished in the inside, and several are fitted in a frame, the upper part of which forms a trough, into which the moulds all open: thus, by pouring into the trough, all the molds are filled at once.

Wax candles are not molded, on account of the great amount of contraction which wax undergoes in cooling, and the difficulty of drawing it from the molds. The wicks are warmed, and suspended over a basin of melted wax, which is poured over them until they acquire the proper thickness; they are then rolled, while hot, between two flat pieces of smooth, hard wood, kept wetted to prevent adhesion.

Great improvements have recently been made in the manufacture of candles, and these are interesting as results of the progress of scientific chemistry—of theory applied in practice. All oils or fats are composed of one or more fatty acids combined with a base, called glycerine. The fatty

CANDLE.

acids constitute the combustible and more solid portion of the compound. Both acid and base are very weak, and it is a general law in chemistry, that a strong base, under favorable conditions, will separate a weaker one from its acid, by combining with the acid, and taking the place of the weak base; and a strong acid will in like manner displace a weaker one. Lime is a strong base, and being cheap, is used to separate the glycerine from the fatty acid of tallow, palm-oil, etc. This it does when the melted fat is stirred for some hours with a mixture of lime and water. The lime forms a hard insoluble soap, by combining with the fatty acid, and the glycerine remains in solution with the water. This lime-soap is then broken to powder; and the weak, fatty acid separated by means of sulphuric acid, which combines with the lime, forming sulphate of lime. The whole being heated, the fatty acid floats on the top, is skimmed off, and the candles made from it. These are called composite candles; they give a purer light than ordinary tallow, being freed from the glycerine, which not only softens the fat, but diminishes its combustibility. Pure stearic acid, or stearine, the chief fatty acid of tallow, is a hard crystalline substance, perfectly dry, and free from any greasiness, with a somewhat pearly lustre. Its crystalline structure presents a difficulty in the manufacture of candles, for when cast in molds, it contracts on cooling, and leaves small spaces between the crystals. This has been obviated by mixing a little arsenic with it; but this method is now abandoned, on account of the poisonous gas evolved by the combustion of such candles, and the desired effect is obtained by mixing the stearine with a little wax, and pouring it into hot molds.

To obviate the necessity of snuffing candles, several contrivances have been adopted; in all of them, the object is effected by causing the wick to bend over and its end to fall outside of the flame, and thus, by coming in contact with the oxygen of the air, to be completely burned—for such combustion cannot take place within the flame: see FLAME. This bending over is variously brought about. One method is by twisting the wick with one strand shorter than the rest, which is strained straight while the candles are being cast; and when released by the melting of a portion, it contracts, and bends the wick. Another method is by adding on one side of the wick a paste, consisting of a mixture of borax, bismuth, flour, and charcoal. Another, by coating one of the threads of the wick with a metallic envelope, by dipping it in fused bismuth; the metal fuses at the end of the burning wick, and forms a small globule, which bends the wick over, and is itself readily combustible at a red heat. These are called *metallic* wicks. Various other contrivances have been adopted for the same object. *Paraffine* (q.v.), a white crystalline body, obtained by distillation from cannel coal, etc., affords a beautifully white and clear material for candles, and having thus in a great degree the properties of wax at a much smaller expense, it has lately been much used for

CANDLEBERRY.

this purpose. *Ozokerit* is another oily mineral substance used for candles.

Candles were early introduced—with symbolical signification—into Christian worship, and are still so employed in the Rom. Cath. Church. In the Church of England, candles are sometimes placed on the altar; but the practice is a subject of controversy. The numerous superstitious notions and observances connected with candles and other lights in all countries had a more remote origin, and may be considered as relics of the once universally prevalent worship of the sun and of fire. Numerous omens are taken from them, and they are also used as charms. The following are some of the waning but still lingering superstitions. In Britain, a portion of the tallow rising up against the wick of the candle, is called a winding-sheet, and regarded as a sure omen of death in the family. A bright spark at the candle denotes that the party directly opposite is to receive a letter. Windy weather is prophesied from the waving of the flame without visible cause, and wet weather if the wick does not light readily. Corpse-candles are lights appearing to spring up from the ground, or issue out of a house, and traverse the road or air by invisible agency; they are ominous of death; their route indicates the road the corpse is to be carried for burial; and the size and color of the light tell whether the fated person is young or old. This superstition lingers chiefly in Wales. It is or was customary in some places to light a candle, previously blessed, during the time of a woman's travail. C. were supposed to be efficacious after death as well as before birth, for they were placed on the corpse. The object was doubtless to ward off evil spirits, who were supposed to be always on the alert to injure souls on entering and on quitting the world. See CANDLEMAS.

CAN'DLEBERRY, or CANDLEBERRY MYRTLE, or WAX TREE, or WAX MYRTLE, or TALLOW TREE, or BAYBERRY (*Myrica cerifera*): small tree or shrub, 4-18 feet high, but generally a low, spreading shrub; native of the United States, but a most abundant and luxuriant in the southern states. It belongs to the nat. ord. *Amentaceæ*, sub-order *Myriceæ*, according to some, a distinct nat. ord., distinguished by naked flowers, with 1-celled ovary, a drupaceous fruit (stone-fruit)—the scales becoming fleshy—and a single erect seed. The genus *Myrica* has male and female flowers on separate plants; and the scales of the catkin in both male and female flowers are concave. The C. has evergreen oblongo-lanceolate leaves, with two small serratures on each side at the point, sprinkled with resinous dots. The bark and leaves when bruised emit a delightful fragrance. The drupes—popularly called berries—are about the size of peppercorns, and when ripe, are covered with a greenish-white wax, which is collected by boiling them and skimming it off, and is afterward melted and refined. A bushel of berries will yield four or five pounds. It is used chiefly for candles, which burn slowly with little smoke, and emit an agreeable balsamic

CANDLE-FISH.

odor, but do not give a strong light. An excellent scented soap is made from it.—*M. Gale* is the SWEET GALE of the moors and bogs of Scotland, well known for its delightful fragrance, native of the whole northern parts of the world. Several species are found at the Cape of Good Hope, one of which, *M. cordifolia*, bears the name of WAX SHRUB, and candles are made from its berries.

CANDLE-FISH, or EULACHON (*Thaleichthys Pacificus*): remarkable fish of the family *Salmonidæ*, nearly allied to the Capelin (q.v.), and, like it, strictly a sea-fish, approaching the coasts to spawn, but not entering rivers. The C. inhabits the Pacific Ocean, near the w. shores of America, from Vancouver's Island northward. It is not larger than a smelt, has a somewhat pointed and conical head, a large mouth, teeth on the pharyngeals, and the tongue rough, but the lower jaw, palatines, and vomer destitute of teeth. The color is greenish olive on the back, passing into silvery white on the sides and belly, sparsely spotted with dirty yellow. It is probably the fattest or most oleaginous of all fishes, or indeed of animals, and is used by the Indians not only as an article of food, but for making oil. To broil or fry it, is nearly impossible, because it almost completely melts into oil. Indeed, the Indians often use it, in a dried state, as a lamp for lighting their lodges, merely drawing through it a piece of rush-pith, or a strip from the inner bark of the 'Cypress Tree' of these regions, *Thuja gigantea*—a species of arbor vitæ—as a wick, a long needle of hard-wood being used for this purpose; and the fish being then lighted at one end, burns steadily until it is all consumed. In order to use the dried fish for food, the Indians often melt it into oil, by the application of heat, and drink the oil. It is also eaten unecooked. Drying is accomplished without any gutting or cleaning, the fish being fastened on skewers passed through the eyes, and hung in the thick smoke at the top of sheds in which wood-fires are kept burning. They soon acquire a flavor of wood-smoke, and the smoking helps to preserve them. They are then stowed away in large frails, made from cedar-bark or rushes, in order to be used for food in winter. Immense shoals of C. approach the shores in summer, and are caught in moonlight nights, when they come to sport at the surface of the water, which may often be seen glittering with their multitudes. The Indians paddle their canoes noiselessly among them, and catch them by means of a monster comb or rake—a piece of pine-wood from six to eight feet long, made round for about two feet of its length at the place of the hand-gripe, the rest flat, thick at the back, but having a sharp edge in front, where teeth are driven into it about four inches long, and an inch apart. These teeth are usually made of bone, but the Indian fishers have learned to prefer sharp iron nails when they can get them. One Indian, sitting in the stern, paddles the canoe; another, standing with his face to the bow, holds the rake firmly in both hands, the teeth pointing sternward, sweeps it with all its force through the glittering mass, and brings it to the surface

CANDLEMAS.

teeth upward, usually with a fish, and sometimes with three or four, impaled on each tooth. This process is carried on with wonderful rapidity. When a sufficient quantity of C. has been dried for winter, the rest that are caught are made into oil, being, for this purpose, piled in heaps until partially decomposed, and then placed in large square pine-tree boxes; a layer about three deep in the bottom of each box, covered with cold water, and a layer of hot stones put in, then a layer of small pieces of wood, another layer of fish, stones, and so on. The oil is skimmed from the surface of the water in the boxes. A vast quantity of oil is thus obtained. The C. is an excellent article of winter-food in a climate of which the winter is severe; and notwithstanding its excessive fatness, is of agreeable flavor. It has not yet become an article of economical value to the civilized inhabitants of n.w. America, but seems likely to do so, and to acquire some commercial importance.

CAN'DLEMAS, in its Ecclesiastical Meaning: feast of the purification of the Virgin Mary, observed Feb. 2. This festival is very strictly kept by the Rom. Cath. Church, there being a procession with many lighted candles, and those required for the service of the ensuing year being also on that occasion consecrated; hence the name Candlemas day. In Scotland, this day is one of the four term-days appointed for periodical annual payments of money, interest, taxes, etc., and of entry to premises—the three other term-days there being Whitsunday, Lammas, and Martinmas: see TERM.

An old document of the time of Henry VIII., preserved in the archives of the Soc. of Antiquaries, London, concerning the rites and ceremonies in the English Church, speaks thus of the custom of carrying candles: 'On Candlemas daye it shall be declared that the bearyinge of candles is done in the memorie of Christe, the spirituall lyghte whom Simeon dyd prophecye ["a light to lighten the Gentiles"], as it is redde in the church that daye.' But an older and heathen origin is ascribed to the practice: the Romans were in the habit of burning candles on this day to the goddess Februa, the mother of Mars; and Pope Sergius, seeing it would be useless to prohibit a practice of so long standing, turned it to Christian account by enjoining a similar offering of candles to the Virgin. The candles were supposed to have the effect of frightening the devil and all evil spirits away from the persons who carried them, or from the houses in which they were placed. An order of council in 1584 prohibited the ceremony in England. There is a tradition in most parts of Europe to the effect that a fine C. portends a severe winter. In Scotland, the prognostication is expressed in the following distich:

'If Candlemas is fair and clear,
There'll be twa winters in the year.'

Christ's presentation, the holiday of St. Simeon, and, in the n. of England, the wives' feast-day, were names given

CANDLE-NUT—CANDY.

to Candlemas day. See Brand's *Popular Antiquities*, Bohn's edition.

CANDLE-NUT (*Aleurites trilobo*): tree of the nat. ord. *Euphorbiaceæ* (q.v.), native of the South Sea Islands, Madagascar, Molueca, Java, etc.; producing a heart-shaped nut with a very hard shell, and a kernel eatable when roasted, although in a raw state it has in a slight degree some of the active properties so common in the *Euphorbiaceæ*, and is apt to cause purging and colic. It is about as large as a walnut. An excellent bland oil is procured from it, used both for food and as a lamp-oil. The inhabitants of the Society Islands after slightly baking these nuts in an oven, and removing the shell, bore holes through the kernels, and string them on rushes, hanging them up in their houses, to be used for torches, which are made by inclosing four or five strings in a leaf of the screw-pine (*Pandanus*). These torches are often used in fishing by night, and burn with much brilliancy. The lampblack used in tattooing was obtained from the shell of the candle nut. A gummy substance exudes from the C. tree, which the Tahitians chew.

CANDLISH, *kānd'lish*, ROBERT SMITH, D.D.: 1806–1873, Oct. 19; b. Edinburgh: Presb. clergyman. He entered the Univ. of Glasgow 1822, and was licensed as a preacher in connection with the Established Church 1828. In 1834 he became minister of St. George's, Edinburgh. With intense zeal, he advocated the justice and necessity of ecclesiastical reforms, and became one of the boldest and most vigorous leaders of the popular or 'non-intrusion' party. After the Disruption (see FREE CHURCH), he co-operated with Dr. Chalmers and other chiefs of the newly-formed denomination, in organizing, consolidating, and extending its aggressive efforts. In 1845–6, he was active in the establishment of the Evangelical Alliance. In 1847, he was, when Dr. Chalmers died, appointed to the chair of divinity in the New College, Edinburgh, but did not assume the functions of this office. In 1862, he was appointed principal of the same college. A Life by Wilson appeared 1880. C. wrote *Contributions towards the Exposition of the Book of Genesis; The Atonement, its Reality and Extent; An Examination of Mr. Maurice's Theological Essays; The Fatherhood of God; and an Exposition of the First Epistle of St. John*.

CANDOCK, n. *kān'dōk* [probably from *can*, and *dock*]: a plant that grows in rivers; the yellow water-lily or *Nūphar lutěum*, ord. *Nymphæacæ*.

CANDOR, n. *kān'dēr* [L. *candor*, a dazzling whiteness—from *candēō*, I shine: It. *candore*—lit., a dazzling white]: fairness; frankness; openness; sincerity; freedom from any intention to deceive.

CANDROY, n. *kānd'roy*: a machine used in preparing cotton cloths for printing. It spreads out the fabric as it is rolled round the lapping roller.

CANDY, n. *kān'dī* [F. *candir*, to candy—from *candi*, candied—from It. *candì*, candy: Turk. *cand*, sugar: Ar. *gand*, sugar; *gandat*, sugar-candy]: crystallized sugar;

CANDY—CANE.

sugar compounded with anything else: V. to boil or dress in sugar; to cover or incrust with sugar; to form sugar into crystals. CAN'DYING, imp.: N. the act of forming into crystals, as sugar. CANDIED, pp. *kān'dīd*: ADJ. cooked and covered with crystallized sugar; flattering, as words having only the appearance of sweetness and fairness.

CAN'DY: see CEYLON.

CAN'DYS [Gr.]: a loose gown, worn by the Medes and Persians over their other garments. It was made of woolen cloth, either purple or of some other brilliant color, and had wide sleeves. In the sculptures at Persepolis, nearly all the personages are represented as so attired. A gown very similar is still worn by Arabians, Turks, and other orientals.

CANDY-SU'GAR: popular name of ordinary sugar when procured in large crystals by the gradual and slow cooling of a concentrated solution of sugar: see SUGAR.

CANDYTUFT, n. *kān'dī-tūft* [*candy*, and *tuft*], (*Ibéris*): genus of plants of the nat. ord. *Cruciferae*, distinguished by unequal petals, the largest being toward the circumference of the dense corymbs in which the flowers grow, and by an emarginate pouch with the valves keeled and winged, the cells one-seeded, and the cotyledons accumbent: see COTYLEDON. The species are found chiefly in the countries surrounding the Mediterranean Sea, and the name C. is supposed to be derived from the island of Candia, the name *Iberis* from Iberia (Spain). The species *I. amara* is remarkable for bitterness. Some species are slightly shrubby; some are herbaceous perennials, some annuals. Some are among the most familiar ornaments of flower-gardens, as the annual White and Purple C. (*I. umbellata*), the Sweet-scented C. (*I. odorata*), and two slightly shrubby species, *I. sempervirens* and *I. semperflorens*, the latter of which, in favorable situations, continues to blossom through the whole winter, and is pleasing by the abundance and the perfect whiteness of its flowers.

CANE, n. *kān* [L. *canna*, a reed or cane: It. *canna*: F. *canne*]: a long, strong reed; the commercial name for the stems of various grasses, palms, etc.; a walking-stick: V. to beat or flog with a cane. CA'NING, imp.: N. a flogging with a cane. CANED, pp. *kānd*. CANY, a. *kā'nī*, pertaining to; abounding in canes. CANE-SUGAR: see SUGAR. CANE-TRASH, the refuse of sugar-cane used as fuel in boiling the sugar. SUGAR-CANE, the *Sac'chārūm officinārum*, and others, ord. *Gramīnēæ*: the bamboo, *Bambūsa arundīnācēa*, ord. *Gramīnēæ*. RATTAN-CANES, the stems of *Calāmus scīpiōnem*, and *rotang*, ord. *Palmeæ* (see RATTAN)—and others, imported for making walking-sticks.

CANE, *kān*, or KEN, *kēn*: river rising in Bundelcund, near lat. 23° 54' n., long. 80° 13' e.; after a n.n.e. course of 230 m., entering the Jumna in lat. 25° 47' n., long. 80° 35' e. It is too rapid and broken for navigation; and is remarkable for the matchless beauty of its pebbles.

CANEA—CANELLA.

CANEA, *kā-nē'a*, or **CANNA**, *kān'nā*, called *Khanía* by the Greeks: chief commercial town of Candia or Crete, and cap. of a province. It is on the n. coast, and occupies the site of the anc. Cydonia. The present city is of Venetian origin, and dates from 1252, when a colony was sent from Venice to occupy it. The object of its foundation was to keep down the Greeks, who had been in arms, and at open war with their Italian lords, almost without intermission from the day when the Venetians first set foot on their shores. Venetian coats of arms are still observed over the doorways of some of the principal houses. C. is surrounded by a strong wall and deep ditch, both much dilapidated; it has a safe but very shallow harbor. C. is the principal mart for Candian commerce, and exports, especially to France and Italy, large quantities of oil, soap, wax, and other products. Several consuls are stationed here, and it is the residence of the Turkish gov. of the province, and of the Greek bishop. The language spoken is modern Greek. The environs are very beautiful. Pop. 24,537; of which two-thirds are native Greeks, the rest mainly Turks.

CANE-BRAKE, *kān'brāk* (*Arundinaria macrosperma*): large reed or grass, indigenous to the warmer parts of the United States; of a genus allied to the bamboo. Its flowers are in panicles. It grows in marshy places.

CANE DELLA SCALA, *kā'nā del'lā skā'lā*, called the Great, and **CAN GRANDE**: 1291–1329, July 22; b. Verona, Italy: podesta or prince there from 1312. He took Vicenza from the Guelphs of Padua 1314, and defeated them again, 1317; became cap.gen. of the Ghibelline League 1318, and was excommunicated by the pope, 1320. After gaining many victories and taking Padua 1328, Sep. 10, he died in the cathedral of Treviso, during a triumphal entry. Sismondi calls him the ablest captain of his party in Italy, 'the best soldier, the best politician, and the person whose services and attachment the emperor most valued.' Dante, who was entertained at his palace 1314–18, celebrates C. in canto xvii. of the *Paradiso*, and addressed to him a long letter explaining the plan of the *Divina Commedia*. His tomb, by Bonino de Campione, adjoins the church of Santa Maria Antica at Verona.

CANELLA, *ka-nē'l'a* (*Canella alba*): small tree common in the West Indies, where it is often called **WILD CINNAMON**. Its place in the botanical system has not been exactly ascertained, but it seems allied to *Pittosporaceæ*. The fruit is a small black berry. The whole tree is very aromatic, and its flowers are extremely fragrant. The bark of the young branches is the *C. Bark* of apothecaries, known in commerce as *White-wood Bark*, and sometimes called *White Cinnamon*. It forms a considerable article of export from the Bahamas. It has an aromatic fragrance, regarded as intermediate between that of cinnamon and that of cloves, and a bitterish, acrid, pungent taste. It is employed as a stomachic and stimulant tonic, and as an aromatic addition to tonics or to purgatives, in debilitated conditions of the digestive organs.

CANEPHORI—CANGIAGI.

CANEPHORI, *kā-něf'ō-rī*: girls annually chosen from noble families at Athens to walk in the procession at the Panathenaic and perhaps at other festivals, carrying on their heads baskets containing the apparatus needed for a sacrifice. Figures of them are shown on the frieze of the Parthenon in the British Museum. The sculptors Scopas and Polycletus copied the graceful attitudes of these girls, and this type of statue came into use in architecture to support light entablatures. The C. are sometimes identified or confused with Caryatides.

CANESCENT, a. *kā-nēs'sěnt* [L. *canes'cens* or *canescen'tem*, becoming white—from *cānus*, gray or hoary]: in *bot.*, hoary; approaching to white.

CANES VENATICI, *kā'nēz vē-năt'ī-sī* [L., hunting dogs]: a constellation of the n. hemisphere, added by Helvetius, and known generally as the grayhounds of Helvetius. The dogs are distinguished by the names of Asterion and Chara. On the celestial globe, they are represented as being held in leash by Bootes, and apparently pursuing Ursa Major (q.v.) round the pole of the heavens.

CANG, *kǎng*, or **CANQUE**, or **KEA**: instrument of degrading punishment in China. It consists of a large wooden collar fitting close round the neck, weighing usually 50 to 60 pounds. Over the parts where the C. fastens are pasted slips of paper, on which the mandarin places his seal, so that the culprit may not be relieved until the full term of his sentence has expired, which sometimes extends to 15 days. On the C. is also inscribed, in large letters, the offense and the duration of the punishment. The criminal having been paraded through the streets by the police, is then left exposed in some thoroughfare of the city. As he is incapable of using his hands to feed himself, he has to be fed while suffering the penalty.

CANGAS DE ONIS, *kān'gās dā o-nēs'*: town of the Asturias, Spain, about 35 m. e.s.e. of Oviedo. It is a poor place, but in its vicinity are one or two interesting monastic structures, and the cave whence the Goths fled and hid themselves, after the battle of Guadalete, in 711, and from which, in 718, they issued, and annihilated the Moorish invaders. Pop. 7,000.

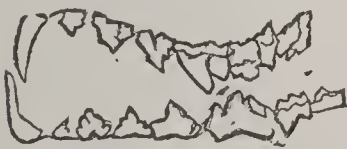
CANGIAGI, *kān-já'jē*, or **CAMBIASO**, *kām-be-á'zo*, **LUIGI**: 1527–85; b. Genoa: painter. He studied under his father, and at Rome, from the works of Michael Angelo; gained high reputation at an early age, and was said to paint very rapidly, and equally well with both hands. Pope Gregory XIII. employed him, and Philip II. invited him, 1583, to Spain, to decorate the Escorial, in which he painted the *Assemblage of the Blessed* on the ceiling of the choir. His best works, after this, are the *Rape of the Sabines*, the *Martyrdom of St. George*, *Judith*, and a *Sleeping Cupid* at Paris. C. died at Madrid. Most of his pictures are at Genoa or in Spain.

CANICATTI—CANIDÆ.

CANICATTI, *kâ-nê-kât'tê*: town of Sicily, province of Girgenti, 15 m. e.n.e. of the city of Girgenti. It is situated on the banks of the Naro, is well built, and has sulphur mines. The people are principally engaged in agricultural pursuits. Pop. (1891) 21,929.

CANICULAR, a. *kă-nîk'ũ-lêr* [L. *canic'ũla*, a little dog—from *cănis*, a dog]: belonging to the dog-star. Canicula was an old name of Canis Minor (q.v.); it was also used to denote Sirius, or the dog-star, the largest (to the eye) and brightest of all the stars, and which is situated in the mouth of Canis Major (q.v.). From the Heliacal rising (q.v.) of this star (Sirius), the ancients reckoned their dog-days, or *Dies Caniculares*, 40 in number—20 before, and 20 after the rising of the star. The rising of the dog-star was in ignorance supposed to be the occasion of the extreme heat and the diseases incidental. It was by mere accident that the rising of the star coincided with the hottest season of the year, in the times and countries of the old astronomers. The time of its rising depends on the latitude of the place, and is later and later every year in all latitudes, owing to precession. In time the star will rise in the dead of winter. The Canicular year was that known among the Egyptians and Ethiopians; computed from one rising of Sirius to the next, and consisting ordinarily of 365 days, and every fourth year of 366. This year was sometimes called the Heliaeal year. The reason for computing the year from the rising of Sirius seems to have been that, at the time, the heliaeal rising coincided with the greatest swelling of the Nile.

CANIDÆ, *kăn'ĩ-dê* [L. *canis*, a dog]: family of the Digitigrade (q.v.) section of carnivorous mammalia, which, as now generally defined, is less extensive than the Linnaean genus *Canis*, the hyenas being excluded from it, and referred to the family *Viverridæ* (civets, ichneumons, etc.). These families are, indeed, closely connected, and hyenas may be said to form a connecting-link between them, the dentition, however, making a nearer approach than in either of them to that of the cats or *Felidæ*.—The C. have two flat tuberculous molar teeth or grinders on each side, behind the great carnivorous cheek-tooth—the last



Dentition of Canidæ.

premolar—of the upper jaw, a dentition resembling that of the bear family, or *Ursidæ*, which they resemble further in their power of adapting themselves to vegetable food. Their whole organization fits them to be less exclusively carnivorous than the feline tribe. They have generally three incisors or cutting teeth, with one large canine tooth, and four premolars on each side in each jaw, two true molars on each side in the upper jaw, and three in the lower. The true molars are adapted for crushing either bones or vegetable food. The last premolars in the upper jaw are remarkably large, and particularly adapted for cutting flesh. See DOG: FENNEC: FOX: JACKAL: LYCAON: WOLF: etc.

CANINE—CANKER.

CANINE, a. *kǎ-nîn'* [L. *canīnus*, canine—from *canis*, a dog: It. *cane*]: of or pertaining to a dog; having the qualities of a dog. **CANINE MADNESS**, the madness of a dog; hydrophobia. **CANINE TEETH**, two sharp-pointed teeth in each jaw, one on each side—often simply termed **CANINES**, n. plu. *kǎ-nīnz'*.

CANISIUS, *kā-nē'se-us* **PETRUS**: 1521, May 8—1597, Dec. 21; b. Nimeguen: Dutch Jesuit. His name De Hondt (dog) he turned into Latin. He was the first man in Germany to enter the Society of Jesus, became its provincial, and established colleges at Augsburg, Dillingen, Prague, and Freiburg. He was active in the Council of Trent 1545, preached before Ferdinand I., and urged that emperor to extreme measures against the Protestants. He became rector and vice-chancellor of the Univ. of Ingolstadt 1549, and prof. of theology. His *Institutiones Christianæ Pietatis* (1566) has been reprinted more than 100 times, and translated into many languages; his *Summa Doctrinæ Christianæ* was also much used. He died at Freiburg, Switzerland.

CANIS MAJOR, *kā-nīs mā'jor*, the *Greater Dog*: constellation of the s. hemisphere, below the feet of Orion. It contains Sirius, brightest of all the stars, and its place may be found by means of this star, which is on the continuation of the line through the belt of Orion. According to Flamsteed, this constellation contains 31 stars.

CANIS MINOR, the *Lesser Dog*: constellation of the s. hemisphere; near Canis Major, and just below Gemini. Procyon, of the first magnitude, is its principal star, and is in a direct line between Sirius and Pollux; so that the position of the constellation may be found by means of this star. According to Flamsteed it contains 14 stars.

CANISTER, n. *kǎn'is-tēr* [L. *canis'trum*, a basket woven from reeds: It. *canestro*]: a box or case for tea, coffee, etc.; in *mil.*, a tin canister having a wooden bottom, packed with balls, and shot from a cannon—called also **CASE-SHOT** (q. v.).

CANKER, n. *kǎng'kēr* [L. *cancer*; F. *chancre*, an eating sore (see **CANCER**)]: a disease in trees which causes the bark to rot and fall off; a corroding ulcer; anything which corrodes or destroys; vaguely applied to various diseases of the lower animals, characterized by their chronic nature, and consisting chiefly in ulceration, suppuration, and the development of fungoid excrescences: V. to eat; to corrode; to consume, as a cancer does the body; to grow corrupt; to waste away by degrees. **CAN'KERING**, imp. **CAN'KERED**, pp. *-kērd*, in *OE.*, corroded; rusted, as a metal. **CAN'KERISH**, a. **CAN'KEOUS**, a. *-ūs*, corroding like a canker. **CANKER-LIKE**, a. **CANKER-BIT**, a. bitten by an animal with ulcerous teeth. **CANKER-FLY**, a fly that lives on fruit. **CANKER**, or **CANKER-WORM**, n. a worm very destructive to plants, and the leaves and fruit of trees; the caterpillar. **CANKER**, n. miner's provincial term for the ochrey matter deposited by ferruginous springs, the water being spoken of as canker-water; in *OE.*, **CANKER** is a name popularly ap-

CANKER—CANKER-WORM.

plied to various wild flowers in the sense of 'wild or worthless'—as, the canker-rose or red field-poppy, the dog-rose, a toadstool, etc.

CANKER: disease of plants, especially fatal to fruit-trees. It is a kind of gangrene, usually beginning in the young shoots and branches, and gradually proceeding toward the trunk, killing the tree in a few years. Wet subsoils seem in many cases to induce it, and it begins most readily in shoots imperfectly ripened and injured by frost, or accidentally wounded. Those varieties of fruit-trees long propagated by grafting and budding are most liable to it. It is sometimes cured by *heading down* the tree, and causing it to throw out new branches.

CANKER: disease in the foot of the horse; believed by Gerlach of Berlin to be truly cancerous. It is observed in two different forms: acute, when the malady is chiefly local; and chronic, when the constitution suffers, and all local remedies fail to restore a healthy function of the structures of the foot.

Symptoms.—It usually commences by discharge from the heels, or the cleft of the frog of the horse's foot. The horn becomes soft and disintegrated, the vascular structures beneath become inflamed, and the pain is intolerable. The animal is therefore very lame on one, two, or all feet, according to the number affected. Though there is no constitutional fever, the horse becomes emaciated, and unfit for work. During wet weather, and on damp soil, the symptoms increase in severity. The sore structures bleed on the least touch, and considerable fungoid granulations, commonly called proud flesh, form rapidly.

Causes.—This disease is occasionally hereditary, and it is most frequently seen in low-bred draught or coach horses. Dirt, cold, and wet, favor the production of the disease, and there is always a tendency to relapse when once an animal has been affected.

Treatment.—Pare away detached portions of horn, and, in mild cases, sprinkle powdered acetate of copper over the sore; apply over this pledgets of tow, fixed over the foot by strips of iron or wood passed between shoe and foot. In severe cases, tar and nitric acid, creosote and turpentine, chloride of zinc paste, and other active caustics, have to be used for a time with the regular employment of pressure on the diseased surface. The animal requires to be treated constitutionally by periodical purgatives and alteratives. Good food, fresh air, and exercise often aid in the treatment.

CANKER: disease in the mouth, usually of children. It is an ulceration of the mucous membrane, and may result from indigestion. It is not often obstinate, and may be treated with borate of soda. Physicians sometimes apply nitrate of silver.

CANKER-WORM (*Anisopteryx*): germs of the order *Lepidoptera*, family *Phalaenites* or *Geometrae*, and group *Hybernidae*. The moths which produce these worms come out of the ground usually in March. The female is wing-

CANNA—CANNE.

less, creeps up a tree, and deposits a cluster of 60 to 100 eggs, attached to a branch by a waterproof glue or varnish. These are hatched early in May: the larvæ feed on the leaves of apple, elm, and other trees. After a month, having attained a length of nearly an inch, they descend, mostly by threads, burrow in the earth, and change to light brown chrysalids within 24 hours, emerging as moths at night in the following autumn or spring. The male has four wings, which when expanded measure $1\frac{1}{2}$ in. This caterpillar has ten legs, but moves by arching the back, bringing forward its rear part, and stretching out to its full length: hence they are called span-worms, inch-worms, or loopers. They may sometimes be dislodged from the trees by shaking the branches, or destroyed by dusting with air-slacked lime when wet, or showering with whale-oil and water. The laying of their eggs may be prevented by applying tar or oil to the trunks. Birds, beetles, and wasps prey upon the worms, and certain small flies pierce the eggs. English sparrows were imported largely with a view to deliverance from this pest. They are described in Harris's *Insects Injurious to Vegetation*, 1862. The American species (*A vernata*), is somewhat smaller than the European, and has darker wings.

CAN'NA: one of the Islands of the Hebrides, off the w. coast of Scotland, 7 m. s.w. of Skye, and 3 m. n.w. of Rum, belonging to Argyleshire. C. is $4\frac{1}{2}$ m. long from e. to w., and 1 m. broad. The surface stands high above the sea, and consists of trap (claystone, porphyry, and trap conglomerate, with fragments of old red sandstone and bituminous wood), which has overflowed thin laminæ of coal and shale. The island has a hill of basalt, called Compass Hill, which reverses the magnetic needle. Pop. (1881) 119.

CANNA, *kăn'na*: plant of the order *Marantaceæ*, valued for lawns, as growing to a height of 3 to 8 ft., with leaves sometimes 2 ft. long. At least 8 varieties are now cultivated. The seeds, hard and black, of *C. Indica* are called Indian shot. *C. coccinea*, in the W. Indies, yields a starch known as *tous-les-mois*, used in place of arrowroot. The smallest species, *C. flaccida*, grows in the south near the coast, and has yellow flowers.

CANNABINACEÆ, *kăn-na-bîn-ă'sē-ē*: nat. ord. of dicotyledonous plants, or, according to many, a sub-order of *Urticaceæ* (q.v.), differing from the proper *Urticaceæ*, chiefly in the suspended exalbuminous seed, and hooked or spiral embryo. Only two plants of the order or sub-order are known, both valuable, HEMP (q.v.), and the Hop (q.v.). See also HASHISH.

CANNABINE, n. *kăn'ă-bîn*, or CAN'NABIN, n. *-bîn*, or CANNABENE, *-bên* [L. *cannābis*, hemp]: a hydrocarbon or volatile oil distilled from the Indian hemp, having a powerful intoxicating action. CANNABIS INDICA, *kăn'ă-bîs in'dî-kă*, Indian hemp (see HEMP: HASHISH). C. SATIVA, *săt-î'vă* [L. *sativus*, fit to be planted]: common-hemp.

CANNE, *kán'nă* {anc. *Cannæ*): town of s. Italy, prov-

CANNEL-COAL—CANNIBAL.

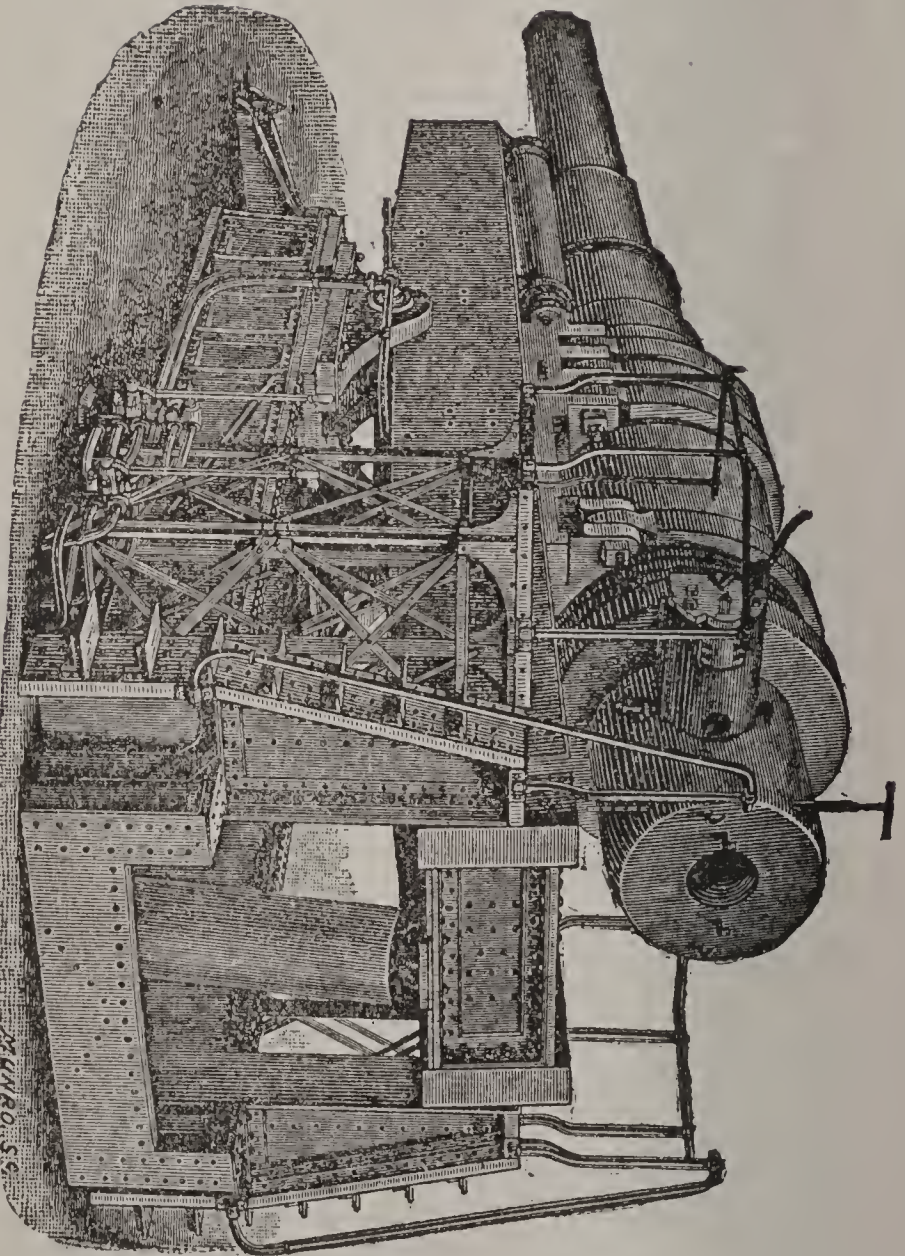
ince of Bari, 8 m. w.s.w. of Barletta, not far from the mouth of the Ofanto, formerly the Aufidus. It is noted for the great victory of Hannibal over the Romans in the summer of B.C. 216. Hannibal crossed the Aufidus at a ford, and attacked the Romans, who, in a short time were almost annihilated by the terrible Numidian cavalry. Among those left dead on the field were Paulus Æmilius, the consul of the previous year; Minucius, the late master of the horse, and a vast number of Roman knights. The loss of the Romans is stated by Livy at 45,000 infantry and 3,000 cavalry. As Hannibal lost in the battle 8,000 men, he did not think it prudent to follow the advice of Maharbal, and advance rapidly on Rome. Twenty thousand Romans were made prisoners, partly on the field of battle, partly in the camp.

CANNEL-COAL, n. *kǎn'něł-kōł* [a corruption of *candle-coal* or *kindle-coal*, so named from its easy ignition and giving out much flame: Norw. *kynnel*, a torch]: a hard, black, inflammable coal, known to the Scotch miners as *parrot-coal*—much used for the manufacture of gas: see COAL.

CANNELURES, n. plu. *kǎn'něł-ūrz* [F. *cannelure*, a channel, a fluting—from L. *canna*, a reed]: small groovings; longitudinal groovings on a pillar.

CANNES, *kǎnn*: seaport town of France, dept. of Alpes-Maritimes, pleasantly situated on the Mediterranean, on the road to Nice. It is famed for salubrity as a winter residence. Lord Brougham used to occupy a fine villa, here. Latterly, the town has been much improved. It has fisheries of anchovies and sardines, and a trade in the produce of the district. Bonaparte, after his escape from Elba, landed about a mile and a half e. of C., 1815, Mar. 1. Pop. (1886) 15,002; (1891) 19,983; (1901) 30,420.

CANNIBAL, n. *kǎn'ně-bǎł* [Sp. *canibal*, a cannibal—from the *Caribs* or *Caribales*, original inhabitants of W. India Islands, who were reputed man-eaters, and some tribes of whom, having no *r* in their language, pronounced their name *canib*]: a savage that eats human flesh; an anthropophagite. CAN'NIBALLY, ad. -*łł*. CAN'NIBALISM, n. -*izm*. The practice of cannibalism is often attributed by classical and early Christian writers to races whose practices they denounce as abominable; but the denunciation is often better evidence of the abhorrence of cannibalism by the denouncers than of its practice by the denounced. Homer describes Polyphemus as eating men, but only as one of his many unnatural attributes as a monster. The early Christian writers frequently attributed cannibalism to the unconverted Pagans. St. Jerome gives his personal testimony to the practice, stating that when he was a little boy living in Gaul, he beheld the Scots—a people of Britain—eating human flesh; and though there were plenty of cattle and sheep at their disposal, yet would they prefer a ham of the herdsman or a piece of female breast as a luxury. Statements in old authors still more absurd induced some thinkers to take the position that canni-



Cannon.—Krupp's 15.6-inch Breech-loading Gun (breech open); Hydraulic Elevating Gear.

CANNIBAL.

balism is unnatural, and to deny that it was ever practiced by human beings except under pressure of starvation. The accurate observation of late travellers has, however, put it beyond doubt that cannibalism has been and is systematically practiced. Comte, as part of his system of positive philosophy, accepting of cannibalism as a condition of barbarism, maintains that the greatest step in human civilization was the invention of slavery, since it put an end to the victor eating the vanquished. The facts, however, which we possess, show that the people systematically addicted to human flesh are not the most degraded of the human race. For instance, in the Australian continent, where the larger animals are scarce, the people, who are of an extremely degraded type, feed on worms and herbs, and have been known only in casual and exceptional conditions to feed on human flesh. The New Zealanders, on the other hand, the most highly developed aboriginal race with which late European civilization has had to compete, were, till recently, systematic feeders on human flesh, despising the inefficient food which satisfied the natives of Australia. In Angas's *New Zealand Illustrated*, there is a picture of the country mansion of the accomplished chief Rangiheta, a fine specimen of elaborately ornamented dwellings in that land. Its name is Kai Tangata, which means, eat man; so called in pleasing memorial of the feasts held within its walls. It has been supposed that the reason why, among the Jews and several eastern nations, the eating of swine's flesh was forbidden as an unclean food, was its resemblance to human flesh, and the danger that persons accustomed to the one might not retain their abhorrence of the other. In the Crusades, the Saracens charged their Christian enemies with eating unclean food, including flesh of men and of swine. In the old romance of Richard Cœur de Lion, he is represented on recovering from sickness, as longing for a piece of pork; but that not being procurable, a piece of a Saracen's head was substituted for it, and pronounced by him to be infinitely more palatable. There have been many dreadful instances where people who naturally had a horror of such food, have been driven by starvation to eat human flesh—as in sieges and shipwrecks. Besides these instances, however, and the systematic cannibals, there is no doubt that people not otherwise habituated to the practice, have been excited by ferocity and revenge to eat, and with relish, the flesh of enemies. In many of the cannibal countries, the flesh of enemies only is consumed. As an instance that this is a natural development of ferocity in degraded natures, we may take the fate of the Princess Lamballe in the French Revolution, whose heart was plucked out by one of the savages of the mob, taken to a restaurant, and there cooked and eaten by him. The great highland chief, Sir Ewen Cameron of Locheil, in a death-struggle with an English trooper, killed him by biting a piece out of his throat, and used to say it was the sweetest morsel he had ever tasted.

CANNING.

CANNING, *kăn'ing*, CHARLES JOHN, Earl and Viscount: 1812, Dec. 14—1862, June 17; second son and youngest child of George C. Educated at Eton and Oxford, he succeeded to the peerage as Viscount C. on his mother's death, 1837, his elder brother, who was a captain in the navy, having been drowned at Madeira 1828. In 1841, he became under-sec. of state for foreign affairs in Sir Robert Peel's government, and afterward commissioner of woods and forests. When Lord Aberdeen came into office he was made postmaster-general; and in the beginning of 1856, he succeeded Lord Dalhousie as gov.gen. of India. His conduct during the awful crisis of the Indian mutiny was decried at the time by some critics as weak; but when all the circumstances of the case became known, the almost universal verdict was that C. had acted with singular courage, moderation, and judiciousness. He died in London.

CANNING, GEORGE: 1770, Apr. 11—1827, Aug. 8; b. London: British statesman and orator. His father, who was of an ancient family, incurred the displeasure of his relatives for marrying beneath his station, and died in poverty when his son was only a year old. His mother (who for a subsistence tried the stage, with little success, married an actor, and subsequently a linen-draper) lived to rejoice in the success and participate in the good-fortune of her boy, whose education was liberally provided by an uncle. C. was first educated at Eton, from which he passed, at the age of 17, to Christ's Church College, Oxford, where he greatly distinguished himself, especially in classics. While here, he cultivated the friendship of the Hon. Charles Jenkinson (afterward Lord Liverpool), who was of considerable service to him in after life. From Oxford he went to Lincoln's Inn, but on the suggestion of Burke, it is said, he soon relinquished the bar for a parliamentary career. He entered the house for Newport, Isle of Wight, 1793, as the protégé and supporter of the minister, Pitt. In 1796, he was appointed an under-sec. of state. It was not, however, until 1798 that C. made a reputation as an orator and a statesman, by his speeches in favor of the abolition of the slave-trade, and against Mr. Tierney's motion regarding peace with the French directory, the latter speech, especially, being regarded as a master-piece of eloquence, alike by the house and by the country. In the debates on the Habeas Corpus Suspension Act, the union with Ireland, and other important questions. C. gave valuable assistance to the ministry, not only by his voice in parliament, but by his pen in a satirical paper, called the *Anti-Jacobin*, in which he especially lashed the 'New Philosophy,' as it was called, promulgated by the French republicans. *The Knife Grinder* is one of the best known and happiest of his efforts in this line. In 1801, Pitt resigned office, and C. joined the opposition against the Addington ministry. When Pitt again became premier, 1804, C. was made treasurer of the navy, an office which he held until Pitt's death 1806. His opposition to the short-lived Grenville ministry which succeeded, savored of the bitterness of party feeling, and his treatment of Fox in his last days, and of his memory after his death, was far

CANNING—CANNON.

from generous. When the Portland ministry was formed in 1807, C. was appointed minister for foreign affairs, a position for which he was specially qualified, and his dispatches, written at this time, are models of manliness and lucidity. In 1812, all his eloquence was enlisted in favor of Rom. Cath. emancipation. During the same year he was elected for Liverpool, for which he was again returned three successive times. In 1814, he went as ambassador to Lisbon, returned in 1816, and was made pres. of the board of control, and supported the Liverpool ministry in all their arbitrary and repressive measures until 1820, when he resigned, in consequence of the action of the government against Queen Caroline. Nominated gov.gen. of India 1822, he was on the eve of departure when the suicide of the Marquis of Londonderry called him to the head of foreign affairs. In this capacity C. conferred lasting benefits on his country. He infused a more liberal spirit into the cabinet; he asserted the independence of British politics against the diplomacy that would have entangled the nation with the Holy Alliance, and gave a new direction and impetus to commercial affairs by a gradual laying aside of the prohibitive system. He arranged the relations of Brazil and Portugal; drew the French cabinet into agreement with the British respecting Spanish American affairs; was the first to recognize the free states of Spanish America; promoted the treaty combining England, France, and Russia, for a settlement of the affairs of Greece, which was signed 1827, July 6; protected Portugal from Spanish invasion; contended earnestly for Rom. Cath. emancipation; and prepared the way for a repeal of the Corn-laws. In 1827, Feb., a stroke of paralysis forced the Earl of Liverpool to resign, and C. was called to form a new administration. His health, however, gave way under the cares of his office, which he found beset with unexpected difficulties and bitter opposition; and he died in the same year. His remains were interred in Westminster Abbey, near those of Pitt. As a parliamentary orator, C. holds a distinguished place in British annals. His acuteness of mind, power of expression, and well-pointed wit, were remarkable; but on the whole as an orator he was inferior to Pitt, Burke, and Fox. He lacked the imposing characteristics of the first, the overpowering enthusiasm of the second, and the winning address of the last. As an administrator he had surpassing ability. He was intensely British, and his foreign policy was of the character best calculated to promote British interests.

In 1800, C. married Miss Joan Scott, who had a great estate and was connected with some of the highest families in the kingdom.

C.'s speeches have been reprinted in 6 vols. 8vo, by Therry; and several memoirs, including one by his private secretary, Mr. Stapleton, have been published.

CANNING, Sir **STRATFORD**: see **STRATFORD DE REDCLIFFE**, **VISCOUNT**.

CANNON, n. *kăn'nŏn* [F. *canon*, a gun—from *canne*, a reed—from L. *canna*, a reed-pipe. It. *cannone*, a cannon—from *canna*, a reed, a tube]: a great gun. **CANNON-BALL**,

CANNON.

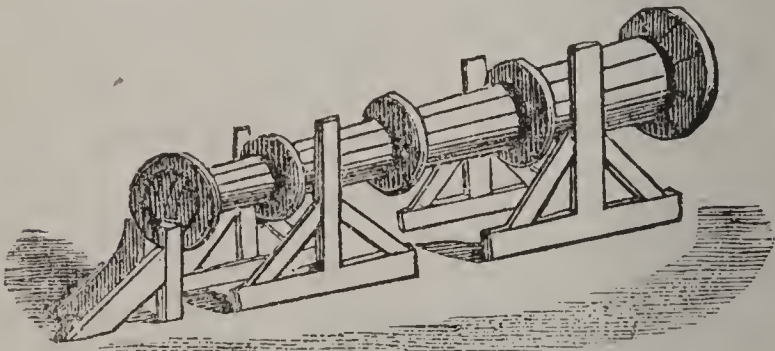
ball for shooting from a cannon. **CANNON-PROOF**, a state of safety from cannon-shot; hence, generally, safety: **ADJ.**, proof against the attacks of cannon. **CANNON-SHOT**, the distance to which a ball can be projected from a cannon. **CAN'NONADE**, *n.* -*ād* [*F.*—from *canon*]: the act of throwing balls from cannons: **V.** to attack with cannons; to batter with balls or shot. **CAN'NONA'DING**, *imp.* **CAN'NONA'DED**, *pp.* **CAN'NONEER'** or **CAN'NONIER'**, *n.* -*nō-nēr'*, the man who manages a cannon. *Note.*—**CANNON** originally meant the 'stock of the arbalist,' then 'the gun-barrel,' and finally 'a piece of ordnance.'

CANNON, *v.* *kān'nōn* [unascertained: may be a simple adaptation from preceding entry]: to hit a ball so as to cause the striker's ball to rebound on to the third—a term in billiard playing. **CANNON**, *n.* a stroke thus played. **CAN'NONING**, *imp.* **CANNONED**, *pp.* *kān'nōnd*, said of a moving body whose direct course has been arrested and deflected by some resistance.

CAN'NON: general name for large pieces of ordnance or artillery, as distinguished from those pieces which can be held in the hand. No military weapon in use before the invention of gunpowder can fairly come under this designation; they were more generally of the kinds described



Earliest forms of English Cannon, from examples in the Tower of London.



Mounting of a Cannon.—From Froissart.

under **BALLISTA**. At what exact date *C.* were first used is not known; but *C.* called 'crakys of war,' were employed by Edward III. against the Scots 1327, by the French at the siege of Puy Guillaume 1338, and by Edward III. at Crecy, and at Calais 1346. Figs. 1 and 2 represent early forms of English *C.* and fig. 3 a mode of mounting the *C.* on carriages. The first *C.* or *bombards* were clumsy, wider at the mouth than at the chamber, and made of iron bars hooped together with iron rings. The balls fired from them were made first of stone. afterward of iron. In the

CANNON.

15th c. various kinds were known by the names of C., bombards, culverins, serpentines, etc. Bombards of great length and power were employed by Louis XI. during his Flemish campaign in 1477, some with stone balls, some with iron. About this time C. began to be made by casting instead of with hooped bars; and bronze or brass as a material began to be used as well as iron. The C. of the 16th c. were generally smaller, but better finished than those of the 15th. The largest C. made in the 17th c., so far as is known, was the Bejapoor cast-iron gun 'Malick é Meidan,' or 'Lord of the Plain,' made either by Aurungzebe or by the Mahrattas; it was 14 ft. long, 28 inches bore, and required a ball of 1,600 lbs. weight. From the time of the great European wars in that century, C. have undergone vast improvements, as well as the science and art of artillery necessary for their management. The following are the chief kinds of 'smooth bore' ordnance still retained in use where rifle guns are not considered necessary:

BRONZE—Guns: 12, 9, 6, and 3 pounders. Howitzers: 32, 24, 12 pounders; and $4\frac{1}{2}$ inch. diameter of bore. Mortars: $5\frac{1}{2}$ and $4\frac{1}{2}$ inch.

CAST-IRON—Carronades (q.v.): 68, 42, 32, 24, 18, 12, and 6 pounders. Guns: 10 and 8 inch: 68, 56, 42, 32, 24, 18, 12, 9, and 6 pounders. Howitzers: 10, 8, and $5\frac{1}{2}$ inch. Mortars: 13, 10, and 8 inch.

WROUGHT-IRON—100 pounder.

By far the most important kind of cannon is now, of course, the rifled ordnance: see **RIFLED ARMS**. The following are the chief kinds now in use: **R.M.L.** = rifled muzzle-loading, **R.B.L.** = rifled breech-loading.

BRONZE—**R.M.L.** guns: 7 and 9 pounders.

STEEL—**R.M.L.** guns: 7 pounder.

WROUGHT-IRON—**R.M.L.** guns: 100, 80, 38, 35, 25, 18, 12, 9, 7, and $6\frac{1}{2}$ ton: 90 cwt. and 70 cwt.: 64 pounder, 40, 25, 16, 13, and 9 pounders.

WROUGHT-IRON—**R.M.L.** Howitzers: 8 inch, 6.6 inch and 6.3 inch diameter.

WROUGHT-IRON—**R.B.L.** guns: 7 inch, 6 inch diameter; 40 pounder, 25, 20, 12, 9, and 6 pounders.

CAST-IRON—**R.M.L.** *converted* guns; 80 and 64 pounders.

A broad distinction is drawn between heavy ordnance, such as may be used in the navy, in fortresses and batteries on the one hand, and field-guns on the other. The standard English field-guns are 9 and 16 pounder muzzle-loaders of wrought iron, though 13 pounders of both breech-loaders and muzzle-loaders have been experimentally used with much success. In 1870, the English field-guns were unquestionably the best in Europe; in 1880, it was generally admitted that they were behind those of every important nation in one or more respects. Germany began to re-arm soon after the war of 1870, and produced the breech-loading guns of Krupp's cast-steel, which are still the standard. Austria followed suit, remodelling her guns after the plan of Colonel Uchatius, making them breech-loaders, the old bronze being so modified as to acquire the name of steel-bronze, though there is no steel in it. France profited by the experience of Germany, her steel breech-loaders being admirable weapons. Italy uses both bronze and steel, and Russia has steel breech-loaders like those of Germany. English guns, it appears, are heavier, and throw less

CANNON—CANNON FOUNDING.

powerful projectiles with a lower velocity than these newer weapons; and Britain has only half as much field-artillery as Austria. The technical name for pieces of artillery is *ordnance* or *guns* rather than *cannon*.

For particulars concerning various kinds of ordnance, see such headings as ARMSTRONG: CANNON FOUNDING: CARRONADE: GUN: HOWITZER: LANCASTER GUN: MORTAR: RIFLED ARMS: SHELL GUN: etc.

CANNON, ALLOYS FOR: metallic composition used for the manufacture of ordnance. Formerly Bronze (q.v.), was largely used, consisting of about 90 parts of copper to about 10 parts of tin. In the casting of small C., such as 8-pounders, the alloy used contained $92\frac{1}{2}$ parts of copper to $7\frac{1}{2}$ parts of tin; while in the larger C. the tin was increased until the proportion reached 88 to 12. The presence of the tin increased the hardness of the alloy, but at the expense of the tenacity. Great care is needed to insure the purity of the copper and the tin. If lead is present, the alloy is always more or less soft, and, moreover, liable to fuse after repeated explosions; while the presence of a mere trace of sulphur, arsenic, phosphorus, etc., renders the alloy very brittle. It was customary, in the casting of C., to use up old C. or other bronze implements, so as to form a beginning of the fused metal in the furnace, and then to add little by little the extra amount of copper and tin. This mode was adopted because of the difficulty in procuring the ready amalgamation of copper and tin, so as to yield an alloy of uniform composition. This point is of great importance, as the metals, when not properly alloyed, are liable to separate during cooling, and yield a C. of variable composition throughout. Except for small steel mountain guns, iron is now the common material—in America, cast or wrought; in England, wrought.

CAN'NON-BALL TREE (*Couroupita Guianensis*): tree of the nat. ord. *Lecythidaceæ*, native of Guiana, of great size, the trunk being often more than two ft. in diameter. It has large ovate-oblong leaves; the flowers are produced in racemes; they are white and rose-colored; and the fruit is large, 'about the size of a 36-pound shot,' nearly round. The hard woody shell of this fruit is used for drinking-vessels.

CANNON-BONE: see under CANON 2.

CANNON FOUNDING: making ordnance by casting. Since Sir W. Armstrong succeeded, about 1854, in making of malleable iron a field-gun, of far greater efficiency than any previously in use, cannon founding has in most European countries gradually ceased. This manufacture, however, is still largely carried on in the United States, Sweden and Russia, countries which produce cast iron of superior quality.

Cannon are cast in molds of loam or sand prepared with the help of a pattern: see FOUNDING. They are usually cast vertically with an extra mass of metal poured in at the top end of each mold to secure by its pressure greater solidity in the walls, as is often done in the case of a hy-

CANNON FOUNDING.

draulic cylinder. This superfluous portion is afterward removed. Cannon are, or at least were, often cast solid with the same object, and afterward bored, though it is not certain that such are generally sounder or of closer texture than those cast hollow. In either case the inner surface of the cannon is accurately finished with a boring tool to the required calibre, and the outer surface turned. Brass, or rather bronze cannon, were usually cast in loam by means of a clay model on which were often stuck ornamental figures in wax, these being melted out of the mold before casting.

In the United States cast-iron guns are made by Rodman's process, that is, they are cast hollow on a core barrel which is filled with water. This is applied so as to cool the metal of the gun in layers, thus modifying the initial strain upon it, and producing the best result that can be obtained from cast iron for ordnance purposes. Within the last few years guns as large in the bore as 20 inches have been cast by this method at Pittsburgh, and one in Russia. The latter weighs 44 tons, throws a spherical ball of 9 cwt., and took $3\frac{1}{2}$ months to finish. Its cost was not more than one-fourth that of a built-up gun of steel for the same weight of projectile.

Many of the earlier pieces of ordnance were made of hooped bars in which can be traced the germ of the process by which the Armstrong gun is made. Indeed it is doubtful if any modern plan of constructing large guns was not tried in olden times, as is seen by an examination of the different kinds of old cannon still preserved; but in lack of the steam-hammer and other modern appliances, the process was difficult and the work was deficient in strength. The earlier wrought-iron cannon were gradually superseded by those made of cast iron and bronze.

The mortar, which was introduced about the commencement of the 14th c., appears to have been not only the most ancient form of cannon but also the first European fire-arm. From the beginning of the 15th c. cannon were cast in bronze, and some of great size are stated to have been used at the siege of Constantinople 1463. Probably hand cannon of cast iron date as far back as bronze guns, and it is known that large and excellent cannon were made of cast iron in the early part of the 16th c., they having been used at Flodden, and England having even then acquired a reputation for this kind of ordnance: see FIREARMS. Cannon founding has therefore been practiced for nearly 500 years, and although the art seems now declining, no one can predict, in these days of metallurgical wonders, the line which further improvements may take. In order that the cast guns made on the old system may still be available for some purposes in modern warfare, Col. Hay Campbell, of the British army, some years ago, proposed a plan for lining bronze, and Sir W. Palliser another plan for lining cast-iron cannon with a tube of wrought iron. Many have been transformed on the Palliser system, which consists in boring a certain thickness off the old gun, and forcing a coiled wrought-iron barrel into the interior; and are said to have shown remarkable endurance.

For peculiarities in the manufacture of special kinds of ordnance, see their titles: see also WAR SERVICES.

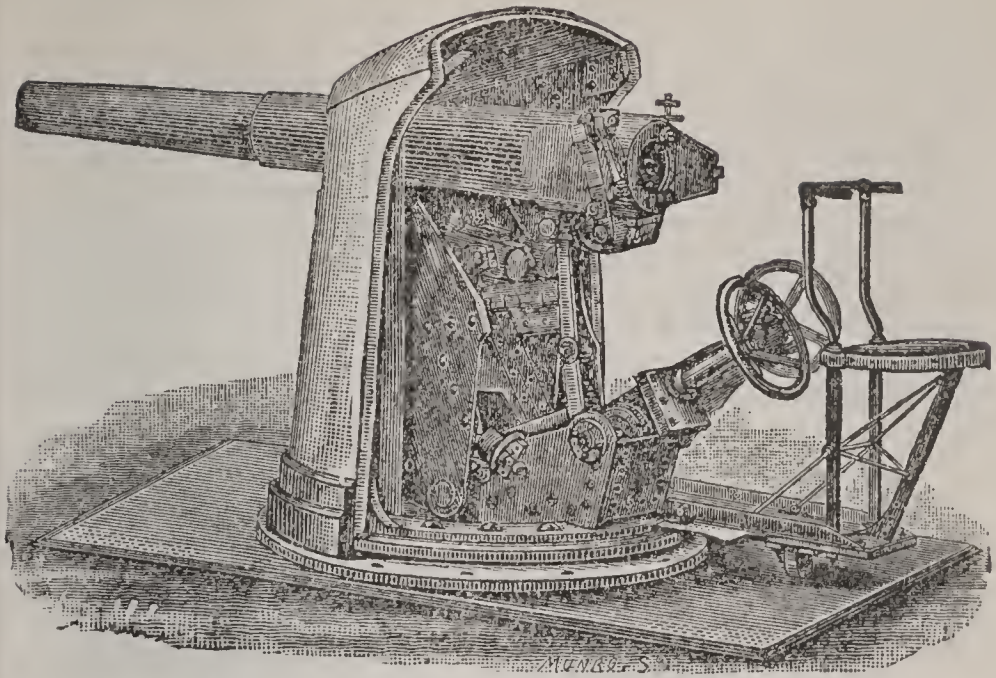
CANNOT, v. and ad. *kăn'nốt* [*can*, and *not*]: to be unable.

CANNSTADT, or KANNSTADT, *kăn'stât*: town of Würtemberg, beautifully situated on the Neckar, about 3 m. n. e. of Stuttgart. It owes its origin to the Romans, of whose presence there are still many traces. Until the 15th c. it was the cap. of Würtemberg. The Wilhelm palace, finished 1851, is notable as a specimen of the elaborate Saracenic style. C. has numerous mineral springs, discharging 800,000 cubic ft. of water in the 24 hours, which are much frequented during the season; manufactures of woollens, cottons, tobacco, etc.; and a large trade by means of the Neckar. C. is now one of the most thriving towns in Germany. Pop. (1880) 16,020; (1891) 20,265.

CANNY, a. *kăn'nĩ* [Scot.: Icel. *kenna*, to perceive by sense]: gentle; cautious and obliging; harmless; nice; safe. NOT CANNY, or UNCANNY, dangerous; not safe.

CANO, *ká'no*, ALONSO: 1601, March—1664 (or 67); b. Granada: illustrious Spanish painter, founder of the School of Granada. He received his first instructions in the principles of art from his father, Miguel C., an architect; studied sculpture under J. Montanes, and painting under Pacheco and Juan de Castillo; and attained celebrity so early that in 1638 or 1639 he was appointed court painter and architect to the king. C. was of a hasty temper, and was accused of having murdered his wife in a fit of violent jealousy, but the accusation appears to have been quite groundless. He was, however, subjected to the torture—the judges sparing his right arm for the sake of his skill in art; but no confession having been elicited, he was acquitted and received again into the royal favor, named residentiary of Granada, and spent his last years in acts of devotion and charity. He died at Granada. In the opinion of Fuseli he excelled all his contemporaries except Velasquez. His eminence in the three departments of the fine arts—sculpture, painting, and architecture—obtained for him the hyperbolical honor of being called the *Michael Angelo* of Spain. His pictures, marked by graceful design and pleasing coloring, are very numerous and are preserved in Granada, Seville, Madrid, Malaga, and other Spanish cities.

CANOE, n. *kă-nố'* [of American Indian origin; said to have been borrowed by the Spaniards (*canoa*) from the native Indian name of such boats; a similar name exists in the Aryan languages: Ger. *kahn*, a boat; O. Fr. *cane*, a ship, and *canot*, a boat. The root of these words is the same as that of *cane* (L. *canna*), a reed or hollow stem, and signifies hollowness, capacity; Gr. *chaino*, to gape or yawn. From the same root come *cann*, a drinking-cup; *cannon* (It. *cannone*, properly a large tube, being an augmentative from *canna*, a hollow stem or tube); *canon* (Gr.), a ruler or straight rod, most readily obtained from a joint of a reed; *canal* (Lat. *canalis*, a pipe or conduit)]: boat made by hollowing and shaping the trunk of a tree; a boat made of skin, or the



Cannon.—Krupp's 3.3-inch Quick-firing Gun.



Canoe of Carib Indians.



Niche with Canopy, Norwich Cathedral.

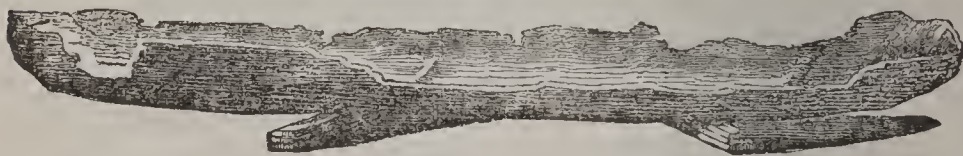


Canadian Trapper's Canoe.

CANON.

bark of trees; a small river-boat propelled by a paddle. Canoes have been made large enough to carry twenty or thirty hogsheads of sugar. Some have decks, and carry sail of rush or silk-grass; but they are generally open boats, rowed by paddles, and steered by an oar. They are seldom wide enough for two men to sit abreast, but vary greatly in length. Near sea-coasts, canoes are often made of light wooden frames, covered with seal-skins, which are also drawn across as a deck, with only a hole left for one man to sit in. In the Hudson's Bay Territories, and some other parts of N. America, canoes are light enough to be carried over the *portages*, where river navigation is interrupted by shallows or by short spaces of intervening land. Canoes hollowed out of the trunks of oaks, seem to have been in

ANCIENT CANOE.



Side View.



Foreshortened View, showing the End.

use among the early inhabitants of the British Islands. They have been dug up in considerable numbers in England, Scotland, and Ireland. They appear to have been chiefly of two sorts—one about 10 ft. long, with square ends, and projecting handles; the other, about 20 ft. long, sometimes sharp at both ends, sometimes round at the prow and square at the stern. The accompanying wood-cut shows one of this last variety, dug out of a marsh in Sussex.

CANON, n. *kān'ōn* [Gr. *kanōn*, a measuring or marking pole, a ruler—from *kanna*, a cane (see CANOE): L. *canon*, a rule; *canonicūs*, regular]: a tried or authorized roll; in *arts* and *sciences*, a rule or standard; in *church affairs*, a rule or law in discipline or doctrine; a decision or decree determined by a church or by a universal council of the church, and invested with authority (see CANON LAW); a rule in general; a catalogue or calendar of saints; specifically, collective name for the books of the Holy Scriptures, called the *sacred canon*, accepted by Christians as the rule of faith and life (see BIBLE); a dignitary of the church; a piece of music in which the first part is taken up and imitated by the other parts, every last step in an equation; anc. name for the prayers recited by Rom. Cath. priests before, at, and after the consecration of the Host (see CANON OF THE MASS); the catalogue of Rom. Cath. saints. CANON LAW, the body of ecclesiastical law originally enacted by the Church of Rome. CAN'ONESS, n. a woman who enjoys an income at

CANON.

tached to a church, but who has no ecclesiastical duty to perform; canonesses in the Rom. Cath. Chh. were usually members of certain orders, lived in common, and busied themselves in educational work. CANONIC, a. *kǎ-nōn'ik*, or CANON'ICAL, a. *-i-kāl*, according to the rules or laws of the church. CANON'ICALLY, ad. *-lǐ*. CANON'ICALS, n. plu. *-i-kāls*, the ecclesiastical dress of a clergyman in some churches, while officiating (see VESTMENTS). CANON'ICATE, n. the office of a canon. CAN'ONIST, n. a man versed in ecclesiastical law. CAN'ONIS'TIC, a. pertaining to the canon law. CAN'ONIC'ITY, n. *-is'i-tǐ*, agreement with the canon of Scripture, or comprehension within it. CANONIZE, v. *kǎn'ōn-iz*, in the *R. Cath. Chh.*, to declare a man or woman a saint, and to inscribe his or her name in the catalogue of saints' names; also, to appoint to a canonry. CAN'ONI'ZING, imp. CAN'ONIZED, pp. *-īzd*. CAN'ONIZA'TION, n. *-i-zǐ'shǔn*, the act of declaring any person a saint. CAN'ONSHIP, n. the benefice filled by a canon; also CAN'ONRY, n. *-rǐ* (see CATHEDRAL). CANON OF THE MASS, the part of the mass beginning after the Sanctus and ending with the last blessing, the central parts of which form the sacred words of consecration of the elements. CANONICAL HOURS, in the *Rom. Cath. Chh.*, particular parts of the day and night set apart for prayer, being seven in number, and named respectively, *matins, prime, tierce, sext, nones, vespers, compline* or *completorium*, as recited in the Roman Breviary; in the *Eng. Chh.*, the legal hours for marriage-ceremony, 8 A.M. to 12 noon. CANONICAL SCRIPTURES, also CANONICAL EPISTLES, the books of Scripture admitted to be of divine origin, as distinguished from apocryphal books.

CANON, or CANNON-BONE, n. *kǎn'ōn* [L. *canna*, a reed-pipe (see CANNON 1)]: one of the long bones in the fore or hind legs of the horse from the hough to the hoof, so named from their tube-like shape; large-sized printing-types—perhaps so named from the tube-like appearance of some parts.

CAÑON, or CANYON, n. *kǎn'yōn* [Sp. *cañon*, the tube or pipe, a cannon: L. *canna*, a reed-pipe]: in *western America*, a deep gorge or ravine between high and steep banks. Of the many cañons the greatest is the Grand Cañon of the Colorado, an awful gorge through which the river flows. Its walls are from 3,000 to 7,000 ft. high, often nearly perpendicular; its length more than 300 miles.

CANON, *kǎn'ūn*: ecclesiastical dignitary, so called as living under a rule, or as following the rule or canon of divine service. His office is of no great antiquity. According to Paschier, the name was not known before Charlemagne. This, however, is not precisely true, for the term C. was applied in the 4th c. to cenobites living under a common rule; but the office of C. is supposed to have been first instituted by Chrodegand, or Chrodegang, Bp. of Metz, 763. It is at least certain that he was the author of the oldest canonical rule, which was simply an adaptation of the monastic rule (commonly but erroneously attributed to St. Augustine) to the priests and 'clerks' especially attached to the service

of a cathedral or other church. It enjoined on the canons manual labor, the practice of silence at certain times, confession twice a year, and other duties needless to specify. The canons formed the council of the bishop, and assisted him in the government of his diocese. They lived in a house called a *monastery*, slept in a common room, ate at the same table, and were originally supported out of the episcopal revenues. In 816, Louis le Débonnaire induced the Council of Aix-la Chapelle to draw up a general rule for the whole body of canons. Canons found their way not long afterward into England, Scotland, and Ireland. Various reforms of C. were made in the 11th and beginning of the 12th c. Gradually, however, many began to emancipate themselves from the restrictions of monastic life, and to live independent of any rule, which is not at all surprising, for the canons were wont to keep apart from the 'lower clergy,' as they called parish priests and others who really labored among the people imparting religious instruction. They were often of noble families, and loved titles—at Lyon they were called *counts*—and in general were men of the world rather than true churchmen. Some of these remodelled canons were called black canons, from wearing a black cassock; others, white canons, from wearing a white habit like the *Præmonstratenses* of Picardy in France. The class of *secular* canons, whose manner of life was not conventual, which class therefore escaped destruction in England when the monasteries were abolished by Henry VIII., probably originated in a tendency to relax the severity of rule enjoined on the regulars, which indeed was hardly less stringent than in the case of ordinary monks. Secular canons still exist in the Anglican Church, and their duties—making allowance for the difference between the Rom. Cath. and Prot. religions—are much the same in kind as they were before the reformation. See CATHEDRAL.

CANON, in Music: a kind of fugue in which not merely a certain period or phrase is to be imitated or answered, but the whole of the first part with which the C. begins is imitated throughout by all the other parts. As in fugues, the melody of the part to be imitated is called the subject, and the others its reply. The C. is the highest degree of mechanical musical contrivance. The ancients spent more time in the construction and resolving of mere puzzling and unentertaining canons, than in the cultivation of good harmony and melody. Good canons, however, are always interesting, and different from any other composition. For a full treatment of the method of writing a C., see Marpurg's *Abhandlung von der Fuge* (Peters, Leipzig).

CANONICAL HOURS, *ka-nōn'ik-al*: times fixed for divine service in the Rom. Cath. Church, but no longer strictly adhered to. These have not always been the same, and it is not known when nor by whom they were settled—some say by Popes Damasus, or Gelasius, or Gregory—but they are now fixed at seven; viz., Matins and Lauds, Prime, Tierce, Sext, Nones, Vespers, and Compline. These used to be observed as follows: Prime,

CANONICUS—CANONIZATION.

Tierce, Sext, and Nones, at the first, third, sixth, and ninth hours of the day, counting from six in the morning; Vespers at the eleventh hour; Compline, or Completorium, as completing the services of the day, at midnight; and Matins shortly after midnight. The modern usage begins Matins at midnight, Prime at daybreak, Tierce at 9 A.M., Sext at noon, Nones at 3 P.M., Vespers at 6 P.M., Compline or Completorium at bed-time. These hours were by the Anglo-Saxons called Uhtsang, Primesang, Undersang, Middaysang, Noonsang, Evensang, and Nightsang. The first two and the last formed the nocturnal, the remaining four the diurnal offices. The reasons given for the dividing the day into seven parts were—that in seven days the creation was completed, that seven times a day the just man falls, there are seven graces of the Holy Spirit, seven divisions of the Lord's Prayer, seven ages of a man's life, etc. The hours had also each its mystical reference to certain sacred occurrences, such as the incidents at our Lord's birth and crucifixion. The word 'hour,' in C. H., is derived, as some have suggested, from *ora*, a prayer; but more probably from *hora*, an hour, and called canonical because according to the canon or rule of the church. The proper offices for the C. H. are set forth in the BREVIARY (q.v.)

In the English Church the hours between 8 A.M. and 12 noon—the only time during which the solemnization of marriage is permitted—are called canonical hours.

CANONICUS, *ka-nŏn'ŭ-kŭs*: abt. 1565–1647, June 4: Narragansett chief. At first hostile to the Pilgrims, he became warmly attached to Roger Williams, to whom he granted lands in R. I. He maintained his friendly attitude toward the whites; but long after his death his tribe was involved in King Philip's war, and was exterminated.

CANONIZATION, *kăn-on-i-zŭ'shŭn*, in the Church of Rome: act of the pope by which a deceased person is solemnly declared a saint. It had its origin in the practice of the early church, of inserting in the commemorative prayer of the Eucharistic Liturgy the roll of the names of those who had died as martyrs, or distinguished themselves as confessors of the faith, not for invocation ('*non invocantur*,' St. Aug. *De Civ. Dei*, xxii. 10), but in memory, for the comfort and example of the living. This record was entered in the diptychs of the church, and read in the so-called 'canon' of the liturgy. Each bishop, until the 10th c., had the power to declare particular deceased persons saints, doubtless with consent of his clergy and people, and later of his metropolitan. The last recorded case by a metropolitan is said to have been that of St. Gaultier, by the abp. of Rouen, 1153 (see Gibbings, *Prelect on the Diptychs*, Dublin, 1864). In the West the exercise of this power came to be reserved to the popes, and the ceremonial itself was invested with much solemnity, and regarded as of high importance. The first papal C. was accomplished by John XV. The popes have possessed the exclusive right since the decree of Pope Alexander III.,

CANON LAW.

1170. The right of *Beatification* (q.v.) also belongs to them. When it is proposed to canonize a person of reputed sanctity the pope declares his views in a consistory, and an inquiry is instituted as to the virtues and merits of the person proposed. The form of inquiry is that of a regular process at law, and an ecclesiastic is specially appointed to contend against the claims advanced, who receives the designation of *Advocatus Diaboli*; and on failure of satisfactory proof the process is abandoned. When a favorable decision is pronounced the ceremony of C. is performed in St. Peter's Church with great pomp. The last C. was in 1881.

The Greek Church also recognizes *Canonization*. The right to perform the ceremony lies with the Patriarch of Constantinople, but it has rarely occurred. An analogy to Christian canonization has been found in the Apotheosis (q.v.) of the ancient Romans.

CANON LAW: collection of ecclesiastical constitutions for the government and regulation of the Rom. Cath. Church, although many of its regulations have been admitted into the ecclesiastical system of the Church of England, and have some influence in other protestant bodies. It was compiled from the opinions of the ancient Latin fathers, the decrees of general councils, and the decretal epistles and bulls of the holy see. These, from a state of disorder and confusion, were gradually reduced into method, and may be briefly described in the following chronological order: 1. *Gratian's Decree*, a collection of ordinances, in three books, commenced by Ivo, Bishop of Chartres, 1114, subsequently corrected and arranged by Gratian, a Benedictine monk, 1150, after the manner of Justinian's *Pandects of the Roman Law*. This work comprises ecclesiastical legislation, as it may be called, from the time of Constantine the Great, at the beginning of the 4th c. to that of Pope Alexander III., at the end of the 12th c. 2. The *Decretals*. They are a collection of canonical epistles, in five books, written by popes alone, or assisted by some cardinals, to determine any controversy, and first published about 1230, by Raimundus Barcinus. They lay down rules respecting the lives and conversation of the clergy, matrimony and divorces, inquisition of criminal matters, purgation, penance, excommunication, and other matters deemed within the cognizance of the ecclesiastical courts. To these five books of Gregory, Boniface VIII. added a sixth, published 1298, called *Sextus Decretalium*, or the *Sext*, itself divided into five books, and all forming a supplement to the work of Barcinus, whose arrangement it follows. The *Sext* consists of decisions promulgated after the pontificate of Gregory IX. Then there came the *Clementines*, constitutions of Pope Clement V., published 1308. These decretals form the principal portion of the canon law. John Andreas, a celebrated canonist in the 14th c., wrote a commentary on them, which he entitled *Novellæ*, from a very beautiful daughter he had of that name, whom he bred a scholar; the father being a prof. of law at Bologna, had instructed his daughter so well in it, that she assisted him in reading lectures to his scholars, and therefore, to perpetuate her mem-

ory, he gave that book the title of *Novellæ*. 3. The *Extravagants* of John XXII. and other later popes, by which term is meant to be denoted documents which transcend the limits of a particular collection of regulations. These three books, viz., *Gratian's Decree*, the *Decretals*, and the *Extravagants*, together form the *Corpus Juris Canonici*, or great body of the 'canon law,' as formerly received and administered by the Church of Rome. There are, however, later publications, of more or less authority, but which do not appear to have received the formal sanction of the holy see.

This C. L., borrowing from the Roman civil law many of its principles and rules of proceeding, has at different times undergone careful revision and the most learned and scientific treatment at the hands of its professors, and was generally received in those Christian states which acknowledged the supremacy of the pope; and it still gives ecclesiastical law more or less to Rom. Cath. Christendom, though its provisions have in many countries been considerably modified by the *concordats* (q.v.) which the popes now and then find it expedient to enter into with sovereigns and governments whose municipal system does not admit of the application of the C. L. in its integrity. Indeed, the fact of its main object being to establish the supremacy of the ecclesiastical authority over the temporal power, is sufficient to explain why, in modern times, it is found to conflict with the views of public law and government, even in the case of the most absolute and despotic governments.

This ecclesiastical system never obtained a firm footing in England, and the great lawyers and statesmen have always shown not only unwillingness to defer to its authority, but even aversion to its rule. There was, however, a kind of national C. L. in England, composed of *legative* and *provincial* constitutions, adapted to the particular necessities of the English Church. The *legative* constitutions were ecclesiastical laws, enacted in national synods, held under the Cardinals Otho and Othobon, legates from Pope Gregory IX. and Pope Clement IV., in the reign of King Henry III., about 1220 and 1268. The *provincial* constitutions are principally the decrees of provincial synods, held under divers archbishops of Canterbury, from Stephen Langton, in the reign of Henry III., to Henry Chicheley, in the reign of Henry V., and adopted also by the province of York in the reign of Henry VI. At the dawn of the reformation, in the reign of Henry VIII., it was enacted in parliament that a review should be had of the C. L.; and till such review should be made, all canons, constitutions, ordinances, and synodals provincial being then already made, and not repugnant to the law of the land or the king's prerogative, should still be used and executed. And as no such review has yet been perfected, upon this enactment now depends the authority of the C. L. in England, the limitations of which appear, upon the whole, to be as follows: that no canon contrary to the common or statute law, or the prerogative royal, is of any

CANONS OF THE CHURCH OF ENGLAND.

validity; that, subject to this condition, the canons made anterior to the parliamentary provision above mentioned, and adopted in the Anglican system (for there are some which have had no reception among the English people), are binding both on clergy and on laity; but that canons made since that period, and having no sanction from the parliament, are, as regards the laity at least, of no force. See CANONS OF THE CHURCH OF ENGLAND.

In Scotland, Presbyterian though the ecclesiastical system of that country be, the old Roman C. L. still prevails to a certain extent. 'So deep hath this canon law been rooted,' observes Lord Stair in his *Institutes of the Scotch Law*, 'that even where the pope's authority is rejected, yet consideration must be had to these laws, not only as those by which church benefices have been erected and ordered, but as likewise containing many equitable and profitable laws, which, because of their weighty matter, and their being once received, may more fitly be retained than rejected.' In two old Scotch acts of parliament, 1540 and 1551, the C. L. is used in conjunction with the Roman law to denote the common law of the country, the expression used being 'the commoun law, baith canon, civil, and statutes of the realme.' See, on the subject generally, the following authorities—Blackstone's *Commentaries*, by Kerr, vol. i. pp. 65 and 66; Stephen's *Commentaries*, 4th edition, vol. i. pp. 61 and 69—vol. ii. pp. 251, 256, 257, and 290—vol. iii. pp. 45, 48, and 421—and vol. iv. p. 242; Dr. Irving's *Study of the Civil Law*; Burn's *Ecclesiastical Law*; Phillimore, *Ecclesiastical Law* (2 vols., 1873); Rosshirt, *Kanonisches Recht*; Phillips, *Kirchenrecht* (8 vols., 1845-1875): also the articles in Wetzer and Welte's *Kirchenlexikon* (Rom. Cath.); Herzog's *Real. Enzyklopädie* (Prot.); Knight's *Political Dictionary*; Wharton's *Law Dictionary*; Dr. Hook's *Church Dictionary*. In regard to Scotland, see Stair's *Institutes of the Law of Scotland*, I. 1, 13. and II. 8, 29; and Erskine's *Institutes*, I. 1, 28.

CANONS, Book OF, in Scottish Ecclesiastical History: code of canons or rules for the Church of Scotland, prepared by the Scottish bishops, in obedience to the command of Charles I., revised by Laud, and confirmed by letters patent under the great seal, 1635, May 23. It tended much to increase the dissatisfaction prevalent throughout Scotland, which soon broke out so violently. It not only required the most strict adherence to the liturgy, then not yet published, but enjoined many things concerning ceremonies in worship beyond what Laud had been able to introduce in the Church of England; it also took away the powers of church-courts, and decreed the penalty of excommunication against all who should deny the government of the church by bishops to be scriptural, while its very first canon decreed that penalty against all who should deny the king's supremacy in ecclesiastical affairs.

CANONS OF THE CHURCH OF ENGLAND: the Constitutions and Canons Ecclesiastical, agreed upon, with

CANOPIC VASES—CANOPY.

the king's license, in the synod held at London, 1603-4. They were drawn up by the convocation in order to give effect to the decisions of the conference held at Hampton, and are, for the most part, a digest of old canons, with some new ones added. They are 141 in number. They are the basis of the ecclesiastical law, as far as the clergy are concerned, but they are not binding upon the laity except so far as they are declaratory of the ancient canon law. There had been a previous body of canons drawn up in 1571, but these had not been sanctioned by the sovereign. In 1640, the convocation then assembled with the parliament prolonged its session beyond it, and passed a body of canons of a very arbitrary character, among other things enjoining that on some Sunday in every quarter every officiating minister should insist on the divine right of kings and their prerogatives, and enforce conformity to the rites of the Church of England. In these canons, it was directed that the communion table should be railed in, and be placed as in cathedrals, as is now done in all Anglican churches. These canons were abrogated by an act passed in the 13th year of Charles II. An account of these canons and those now in force may be found at length in Hook's *Church Directory*.—Every clergyman, when instituted to a benefice or licensed to a cure, promises CANONICAL OBEDIENCE to the bishop—i.e., the obedience due according to the canons of the church.

CANOPIC VASES, *ka-nōp'ik*: vessels used by Egyptian priests to contain the viscera of embalmed bodies. They were arranged in a series of four—the first contained the stomach and larger intestines; the second, the smaller intestines; the third, the lungs and heart; and the fourth, the liver and gall-bladder; and each had on its lid the head of the particular deity who was supposed to preside over the contents.

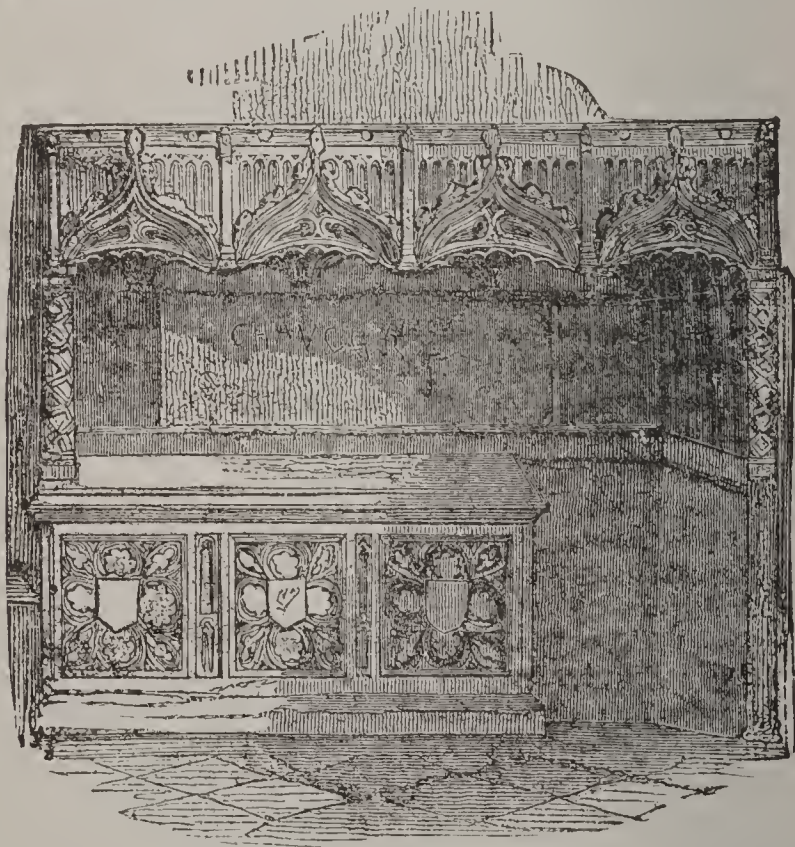
CANOPUS, *ka-nō'pūs*, or CANOBUS, *ka-nō'būs*: city of anc. Egypt, from which the Canopic mouth of the Nile derived its name; on the sea-coast 15 m. e. of Alexandria. The Canopic mouth of the Nile appears to have been at an early period the only one into which foreign ships could enter. At C. the boundary line between Asia and Africa was drawn by the ancient geographers. There was a temple of Hercules here, which was a secure sanctuary to all who fled to it; also one of Serapis, as several extant Greek inscriptions show. The inhabitants of C., a mixed Egypto-Hellenic people, were infamous, in the Greek and Roman times, for their profligacy. The city declined after the rise of Alexandria. Traces of its ruins are visible about 3 m. from Aboukir.

CANOPUS: a very brilliant star of the s. hemisphere, in the constellation of the ship Argo, said by Plutarch to have received its name from Canopos, the pilot of Menelaus.

CANOPY, n. *kān'ō-pī* [F. *canapé*, a couch, a canopy—from mid. L. *canopēum*, the sky, an umbrella—from Gr. *kōnōpeion*, a bed with gauze curtains to keep off flies; from

CANOPY.

kōnōps, gnat or mosquito: comp. Gael. *ceann-bhrat*, a head-cloth, a canopy]: a covering for protection against insects or for shade; a covering over a throne or a bed; a covering over the head; in *arch.*, an ornamental projection over a door, a window, etc. V. to cover with a canopy. CAN'-OPYING, imp. *-pī-ing*. CAN'OPIED, pp. *-pīd*. The derivation of the word canopy throws a curious light on its original meaning, which probably was a mosquito-curtain. The simplest form of C., in this its primitive sense, is that mentioned by Herodotus (ii. 95), who says that the fishermen on the Nile were in the habit of suspending the net with which they had fished during the day on an upright pole, from which it was expanded into the form of a tent, and served to protect them from the attacks of insects during the night. As it has been proved that insects usually will not pass through the meshes of a net, though wide enough to admit them, this simple contrivance may have been effectual for its purpose. Horace (Epod. ix. 9), and others of the ancient writers, mention gnat-curtains (*canopea*). Subsequently, the same term came to be used for



Canopy over Chaucer's Tomb in Westminster Abbey.

the projecting covering and hangings of a bed, without reference to their original use, and latterly for any projecting covering of a similar form, for whatever use or of whatever materials. C. is thus used to signify the covering borne over the heads of kings and other persons of distinction, and still more frequently over the holy sacrament and the image of Christ, in processions in Rom. Cath. countries: see BALDACHIN.

In gothic architecture C. is the term applied to those rich coverings frequently seen over niches and tombs, and

sometimes over doors and windows. It belongs chiefly to the decorated and perpendicular styles, though known much earlier. The C. consists of a roof, which may be supported on pillars all round, or may have one, or if in an angle *two*, sides attached to the wall, with dependent ornamental work representing drapery. The early English canopies are usually simple in form; those in French buildings of the same period being greatly more complicated and elaborate, as, for example, those in the cathedrals of Chartres and Bayeux. In the decorated style, the canopies were richly ornamented and very various in form, as in the accompanying illustration. Some canopies are ornamented by pinnacles supporting smaller canopies, the whole terminating in a structure resembling a small turret, or crocketed spire. In the perpendicular style, though more varied in form, the canopies resemble those in the decorated. Most of the cathedrals and larger churches of England furnish examples of canopies, many of which are enumerated in Parker's *Glossary of Architecture*. For the use of canopies in Italian architecture, see BALDACHIN.

CANOROUS, a. *kă-nō'rūs* [L. *canōrus*, melodious—from *cāno*, I sing]: musical; tuneful. CANO'ROUSLY, ad. -lī. CANO'ROUSNESS, n.

CANOSA, *kā-nō'sā*: town of s. Italy, province of Bari, 13 m. s.w. of Barletta; on the declivity of a steep hill, on whose summit are the remains of an old castle. It has a cathedral; and in an adjoining court is a tomb to Bohemond, Prince of Antioch. It is notable chiefly in connection with the discovered antiquities of ancient *Canusium* (one of the chief cities of the Apulians, the origin of which is obscured in the mists of mythology) on the site of whose citadel the modern town is said to stand. The antiquities consist of subterranean sepulchres, containing painted vases and funereal furniture of the most magnificent description in perfect order, painted busts, and marble statues, etc. Many of the bodies found here were attired in cloth of gold, with head-dresses gleaming with precious stones, and earrings and bracelets of rich and exquisite workmanship. The objects were transferred to the museum at Naples. The ruins of an amphitheatre, aqueduct, etc., have also been found. C. suffered by earthquake in 1851. Pop. 18,500.

CANOSSA, *kā-nō'sā*: town of n. Italy, province of Reggio, about 12 m. s.w. of the city of Reggio, celebrated as the place whither, 1077, the Emperor Henri IV. of Germany went to obtain absolution from Pope Gregory VII., after three days' humiliation. The place, formerly of some importance, is now deserted.

CANOVA, *kā-nō'vā*, ANTONIO: 1757, Nov. 1—1822, Oct. 13; b. Possagno, a village in the Venetian territory: founder of a new school of Italian sculpture. Having evinced in boyhood great talent in modelling, the artist gained the patronage of Giovanni Faliero, a Venetian senator, by whom he was sent to work under a sculptor at Bassano. His first imaginative performance, *Eurydice*, half the size

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of life, was executed in his 17th year. After this he went to Venice, where his study of art properly began. In 1779, Faliero sent him to Rome, with an introduction to Cav. Zuliano, the Venetian ambassador, and one of the most illustrious patrons of art at this time in Italy. In Rome the first result of his studies appeared in the statue of *Apollo*, which must be regarded as his earliest effort in ideal sculpture; but a far greater progress toward the pure style of the antique was evident in his next work, *Theseus with the Centaur*. Nevertheless, C. did not rigorously adhere to the severe simplicity of the antique, but rather took pains to mitigate it by a peculiar grace and loveliness of his own, such as characterized his group of *Cupid and Psyche*, produced soon after he had completed the monument of Pope Clement XIV. This is apparent even in the colossal nonument of Clement XIII. (erected in St. Peter's 1792); though this work, on the whole, is a magnificent effort of genius, simple in style, and with nothing overwrought in the figures. Among his works may be noticed a *Winged Cupid*; *Venus and Adonis*; a *Psyche holding a Butterfly*; *Penitent Magdalen*, in life-size; *Hercules hurling Lichas from the Rock*, a colossal work, not free from affectation; *Kreugas and Damoxenos* (two pugilists); *Palamedes*; and *Perseus with the Head of the Medusa*, a work which, more than all previous efforts, raised his fame. In 1802, C. was appointed by Pope Pius VII. chief curator of all Roman works of art in the Papal States; but was soon called away to Paris, to prepare the model of a colossal statue of Bonaparte.

After the fall of the French empire, C., in 1815, was employed by the Roman government as ambassador to recover the works of art which had been taken to Paris, and visited England. On his return to Rome, he was created Marquis of Ischia, with a pension of 3,000 scudi. This money he expended in the support of art and artists in Rome. C. died in Venice, and a marble statue was erected to his memory in the Church de' Frati, 1827. Another monument to C. was erected in the library of the capitol, by order of Leo XII., 1833.

It is universally allowed that to C. belongs the honor of having restored to sculpture the position which it had lost among modern fine arts. After Michael Angelo Buonarrotti and Bernini, he was the third of epoch-making Italian sculptors. His delicate execution and masterly treatment of marble are unrivalled, and even his faults—viz., his exaggerated nicety and carefulness, and his use of corrosives to produce fine finish—served to attract by novel effects. The essential characteristic of all his works is sentiment—often verging, however, on sentimentalism—and this also, like his delicacy in details, was accordant with the taste prevalent in his time, and was the chief cause of his popularity, as of his errors. When judged by the sterner principles of antique sculpture the works of C. are found deficient in that objective or realistic character which Thorwaldsen could express so well.

During his leisure hours C. amused himself in painting, in which he attained such excellence in following the color-

ing of the Venetian masters, that his pictures have even deceived connoisseurs. In his private life C. was amiable and benevolent. Biographies have been written by Missirini (4 vols. Prato, 1824), Cicognara (Venice, 1823), Rosini, (Pisa, 1825), and D'Este (Florence, 1864).

CANSO, *kǎn'so*, CAPE; eastern extremity of Nova Scotia, and the s. boundary of the entrance of Chedabucto Bay: lat. 45° 17' n., long. 61° west.

CANSO, STRAIT OF, or GUT OF: passage, 17 m. in length and 2½ m. in average breadth, connecting Chedabucto Bay with the Gulf of St. Lawrence. so as to form an island of Cape Breton. Of the three channels between that inland sea and the open ocean it is the one least frequently used by European vessels. It is much used by coasters.

CANSTEIN, *kân'stîn*, CARL HILDEBRAND, Count of: 1667, Aug. 4—1719, Aug. 19; b. Lindenbergh. After studying law at Frankfort on the Oder, and travelling in Italy and England, he became chamberlain to Frederick III., Elector of Brandenburg, and served as a volunteer in a campaign in Flanders. Leaving the army from ill health, he came under the influence of Spener and Franke, devoted himself to pious labors, and founded the Canstein Bible Soc. of Halle, for which he raised a large sum by subscriptions. His plan for diffusing religious knowledge was set forth in *Ohnmassgebender Vorschlag*, 1710. His stereotyped edition of the New Test. appeared 1712, and was sold at about eight cents; the entire Bible followed, 1713. C. wrote a *Harmony of the Gospel*, 1718, a *Life of Spener*, 1729, and a few theological works. He died at Berlin, bequeathing his library and part of his fortune to the orphan asylum at Halle.

CANT, v. *kǎnt* [Gael. *cainnt*, speech, language; *can*, to sing, to name: L. *canto*, I sing]: to speak in a whining tone of voice; in *OE.*, to sell by auction: N. whining, affected, or hypocritical speech; the language peculiar to a trade, profession, sect, or fraternity; barbarous jargon: ADJ. slang. CANT'ING, imp.: ADJ. speaking in a whining tone of voice: N. the talk of one who uses customary religious phrases without any deep or definite meaning. CANT'ED, pp. CANTER, n. *kǎnt'ér*, one who cants. CANT'INGLY, ad. -*lly*. CANTY, or CANTIE, a. *kǎn'ti*, in *Scot.*, talkative and cheerful. *Note.*—CANT, in *politics*, is to use cut and-dry phrases without attaching any definite meaning to them; while to RANT (which see) is to treat very little matters as if they were big ones.

CANT, v. *kǎnt* [Ger. *kanten*, to put a thing upon its edge, to tilt: Dan. *kant*; Sp. *canto*, edge, angle]: to pitch forward; to place upon the edge, as a cask; to jerk; to throw; among *carpen.*, to cut off an angle from a square piece of timber: N. an inclination from a horizontal line; an angle; a thrust; a push; on shipboard, such timbers, near the bow and stern, as lie obliquely to the line of keel. CANT'ING, imp.: ADJ. turning up on edge; giving a sudden thrust.

CAN'T, *kánt*: contracted for *cannot*.

• CANT--CANTABRIAN MOUNTAINS

CANT, *kǎnt*, ANDREW: Scottish divine of the 17th c. (d. abt. 1664): first minister of Pitsligo, in the n. of Scotland, and afterward in Aberdeen. In 1638, July, he was one of the commissioners sent to Aberdeen to compel the inhabitants to subscribe the National Covenant; and in Nov. he was a member of the memorable general assembly, at Glasgow, which abolished episcopacy in Scotland. He was with the Scots army when it obtained possession of Newcastle, 1640, Aug. 30; and in 1641, on the second visit of Charles I. to Scotland, C. preached before his majesty at Edinburgh. In 1660, in consequence of a complaint presented to the magistrates of Aberdeen, charging him with having published a seditious book, entitled *Lex Rex*, and with fulminating anathemas and imprecations against many of his congregation, C. relinquished his charge and left the town.

CANTAB, n. *kǎn'tǎb*, or CANTABRIDG'IAN, n. *-tǎ-brīj'ǎn*: a member or scholar of Cambridge University.

CANTABILE, *kǎn-tǎb'i-le* or *kǎn-tǎ'bē-lā*, in Music: a term having several meanings. In general, it is placed over passages of easy and flowing melody, as well in instrumental as vocal music. In songs, the melodies which lie chiefly in the middle region of the voice are marked C.: extreme tones of the voice have a peculiar *timbre* and character quite foreign to the cantabile. C. marked at the beginning of a piece means rather slow than quick. In the C. style the finest effects can be produced by the singer in swelling, sustained sound, the portamento, etc. C. is also called *cantilene*.

CANTABRI, *kǎn'tǎ-brī*: rude race of mountaineers in anc. Spain, of Iberian origin; in the district now known as Burgos, and on the coasts of the Bay of Biscay, which derived from them the name, *Oceanus Cantabricus*. The most important of their nine towns were Juliobrica (near the source of the Ebro), Vellica, and Concana. The C. are described as like the Scythians and Thracians in hardihood and martial character, sleeping on the bare earth, enduring extreme pain without a murmur, and, like most savages, leaving agricultural toil to their women. Their bravery was evinced in the Cantabrian war, a six years' contest with the Romans, begun under Augustus, and concluded by Agrippa, B.C., 25-19. Tiberius afterward stationed garrisons in the towns of the conquered C.; but some of them retreated into fastnesses among the mountains, where they preserved their independence. They are supposed to be the ancestors of the BASQUES (q.v.).

CANTABRIAN, a. *kǎn-tǎ'brī-ǎn*: pertaining to Cantabria, on the Bay of Biscay, in Spain.

CANTABRIAN MOUN'TAINS, *kǎn-tǎ'brī-an*: general name of the several ranges of coast and boundary mountains, along the n. coast of Spain, from Cape Finisterre, to the s. base of the West Pyrenees, dividing the coast districts from the interior elevated plateau of Castile. The summits of the mountains here and there reach the lower line of the snow region, with a more gentle slope on the s. side, and

CANTAL—CANTATA.

form plateau-districts from 1,600 to 2,000 ft. high on the n., where the slopes are steeper and intersected by coast rivers, leaving in several parts only narrow strips of flat coast-land. In some places the mountains thrust themselves as bold promontories into the sea. The whole group of mountains is named variously by the people of various localities, and includes the Sierra de Aralar, Salvada, Anagña, Sejos, Albas, and Altuna—all more or less wild and romantic, but having those fertile and prosperous trading districts which distinguish the Basque Provinces and Asturias from the sterile central plateau of Spain.

The anc. Cantabria included almost all the Spanish coast of the Bay of Biscay; it is now restricted to the Province of Santander and a part of Asturias. It is a mere popular designation, not the name of a province.

CANTAL, *kǒng-tâl'*: central department of France, formed out of the s. portion of the old province of Auvergne; 2,090 sq. m.; pop. (1891) 239,601. See AUVERGNE.

CANTALEVER, or CANTLIVER: see CANTILEVER.

CANTALOUPE, or CANTALEUP, or MUSK-MELON: a variety of melon, named from Cantalupo, Italy. It thrives in s. Europe, and is abundant in the middle and southern states. See MELON.

CANTANKEROUS, a. *kǎn tǎng'kèr-űs* [comp. Gael. *ceantana-cearr*, a shallow wrong-head—from *cean*, head; *tana*, shallow; *cearr*, wrong]: applied to a quarrelsome, shallow-headed person; in *familiar language*, cross-grained; ill-conditioned in temper. CANTAN'KEROUSNESS, n. crossness; ill-humor; petulance.

CANTARINI, SIMONE; known also as SIMONE 'DA PĒSARO or IL PESARESE: Italian painter: 1612—48 b. Pesaro. He studied under Guido Reni at Bologna; but his intolerable arrogance made him numerous enemies, and he left the city and went to Rome, where he won high reputation and was thought by many to excel even his master in the graceful finish of his brush. On his return to Bologna he opened a school, but soon accepted an invitation from the Duke of Mantua to visit that city. Here also his excessive self-esteem involved him in disagreeable relations with everybody, and at last he quarreled with the duke himself, on which he left for Verona, where he died, under suspicion either of having poisoned himself or of having been poisoned by a Mantuan painter whom he had injured. C. was distinguished in modelling and flesh-coloring. A *Madonna upborne by Angels*, and a head of Guido when old, in the gallery at Bologna, and others elsewhere, remain as proofs of his skill. His 37 etchings closely resemble the etchings of Guido Reni, and have, in several instances, been fraudulently sold with the mark of this master forged upon them.

CANTATA, n. *kǎn-tâ'ta* or *kǎn-tǎ'tǎ* [It.—from L. *canto*, I sing]: a poem set to music. The term is applied indefinitely, and scarcely indicates a traceable distinction from other kinds of musical composition. In Zedler of Halle's great *Lexicon*, the C. is defined as a 'long vocal composition,

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the text of which is Italian,' etc.; while in Sulzer's *Theorie der Schönen Künste*, it is said to be 'a short piece of vocal music of a pathetic nature,' etc. The C. is always more extended and wrought out than the simple song, and consists of different movements.

CANTEEN, n. *kăn-tên'* [F. *cantine*—from It. *cantina*, a wine-cellar]: a tin or wooden vessel for carrying a liquid; the soldier's mess tin carried on the knapsack; leathern or wooden chest, in compartments, containing the plate and other table equipage for a military officer in active service; the refreshment house attached to barracks. The chief articles of food are supplied to the troops direct by the government; but wine, malt liquor, and small grocery-wares, the soldier is left to buy for himself; and in the British army organization, the C. is, or is intended to be, a shop where he can make these purchases economically without going beyond the precincts of the barrack. No soldier is obliged to buy anything at the C.; he may lay out his small sums elsewhere if he prefer. Since 1847 the sale of ardent spirits has been prohibited, and the profits of the C. are now applied for the benefit of the men of the corps.

In French barracks the C. is a sort of club-room for the whole regiment. The cantineer is a non-commissioned officer, who acts merely as an agent for all, selling the liquors and commodities at prime cost.

CANTER, n. *kăn'tér* [a contr. of *Canterbury* gallop: comp. Scot. *cant*, to ride at a hard gallop; *canty*, lively, cheerful]: a lively or cheerful ride; a moderate gallop: V. to run, as a horse in an easy gallop. **CAN'TERING**, imp. **CAN'TERED**, pp. *-têrd*.

CANTER, *kăn'tér*, **WILLEM**: Dutch philologist: 1542–1575; b. Utrecht; was reported to have cared for naught but study. He removed to Louvain, published editions of Æschylus, Euripides, and Sophocles, and a number of critical and philological works, one of which, *New Readings*, was highly praised by Hallam as having done much for ancient literature.

CANTERBURY.

CANTERBURY, n. *kăn'tēr-bēr'ī* [from a city in England]: a stand or receptacle for music, etc. **CANTERBURY-BELLS**, species of *campanula* (q.v.); the *Campān'ŭla mediŭm*, and *C. trachelŭm*, ord. *Campānŭlā'cēa*.

CANTERBURY, *kăn'tēr-bēr'ī*: municipal and parliamentary borough, a county by itself, cathedral city, and seat of the metropolitan see of all England, in East Kent, on the Stour, 56 m. e.s.e. of London, on the high road from London to Dover. The distance from London by the Southeastern railway is 81 m.; by the London Chatham and Dover line, about 60. It stands on a flat between hills of moderate height. It has little manufacture or traffic, though it is noted for its brawn. The chief trade is in corn, wool, and hops. The hop-grounds employ many workers. Pop. (1891) 23,026; (1901) 24,868. C., which formerly returned two members to parliament, was disfranchised for bribery, 1883, but recovered one member, 1885. Some remains of the walls ($1\frac{3}{4}$ m. in circuit and 20 ft. high) which formerly surrounded C. and one of the gates, are still visible. Near the city wall is a large artificial mound, known as the Dane John (probably *Donjon*), and connected with this mound is a public garden, laid out in the end of the 18th c., from the top of which is a fine view of the country around.

The great glory of C. is its magnificent cathedral. When St. Augustine became Abp. of Canterbury, 597, he consecrated, under the name of Christ's Church, a church said to have been formerly used by Roman Christians. Cuthbert, the 11th abp., 740, added a church to the east of this. In the course of ages it received numerous additions, until it assumed its present magnificent form. Among those who helped to repair, enlarge, and rebuild it, were Abps. Odo (940), Lanfranc (1070), and Anselm (1093). In 1174 the choir was destroyed by fire, and in order to the rebuilding of it a number of French and English artificers were summoned. Among the former was a certain William of Sens, and to him, a man of real genius, the work was intrusted. The church was rich in relics: Plegemund had brought hither the body of the martyr Blasius from Rome; there were the relics of St. Wilfred, St. Dunstan, and St. Elfege; the murder of Thomas à Becket (q.v.) had recently added a still more popular name to the list of martyrs. The offerings at these shrines, especially the last, contributed greatly to defray the expenses of the magnificent work. William of Sens did not, however, live to see its completion. He was succeeded by another William, an Englishman, and to him is due the completion of the existing unique and beautiful choir, terminated by the corona or circular chapel called Becket's crown. Gervasius, a monk, who witnessed the fire of 1174, and has left an account of it, relates that the parts of Lanfranc's church which remained in his time were the nave, the central and western towers, the western transepts, and their eastern chapels. In the 14th c., the nave and transepts were transformed into the perpendicular style of that period. The central tower, called the angel steeple, was carried



Cantilever,



Cantharis-fly (*Cantharis vesicatoria*).



Canopy. — Archbishop Peckham's Monument, Canterbury Cathedral.



Canterbury Cathedral.

CANTERBURY.

up (1486–1504) to about double its original height, also in the perpendicular style; it is 234 ft. high, and 35 ft. in diameter. The n.w. tower was taken down in 1834; it was 113 ft. high, and divided into five stories. The Norman plinth still remains on each side of the nave in the side aisles, and portions of Norman ashlar may still be seen about the transepts outside the west wall, and on the east piers of the great tower. The indiscriminate use of the 'Round' or 'Norman,' and the 'Pointed' or 'Early English' arch, is also a very striking feature in the eastern part of the building. The Lady Chapel, now called the Dean's Chapel, stands on the north side of the church, and was built in 1468; the roof is a fan-vault. The north transept is called the Martyrdom, for here took place the murder of Becket, 1170, Dec. 29, Tuesday. Fifty years later the remains were translated from the crypt to a shrine in the newly-erected Trinity Chapel, eastward of the choir. About the year 1500, the yearly offerings at this shrine amounted to £4,000; but they had then declined much in value. A curious mosaic pavement still remains in front of the place where the shrine stood, and the stone steps which lead up to it are worn by the knees of countless pilgrims; but the shrine itself was demolished in 1538, and the bones of the saint burned by order of Henry VIII. In 1643, the building was further 'purified,' as it was called, by order of parliament. Still very many most interesting monuments remain—such as the tombs of Stephen Langton; that which is commonly, but wrongly supposed to be the tomb of Abp. Theobald; with those of the Black Prince, of Henry IV., of Abps. Maphan, Peckham, Chicheley, Courtenay, Sudbury, Stratford, Kemp, Bouchier, Warham, and of Cardinal Pole. The total exterior length of the cathedral is 545 ft. by 156 in breadth at the eastern transept. The crypt is of greater extent and loftier—owing to the choir being raised by numerous steps at the east end—than any other in England.

The Archbishop of C. is primate of all England, metropolitan, and first peer of the realm. He ranks next to royalty, and crowns the sovereign. His ecclesiastical province includes all England, except the six northern counties. Among his privileges, he can confer degrees in divinity, law, medicine, and music. His seats are at Lambeth and Addington Park. He is patron of 149 livings, and has an income of £15,000 a year. There are fourteen old churches in C., mostly of rough flint, and containing fragments of still older structures. St. Martin's Church stands on the site of one of the 7th c., and is built partly of ancient Roman brick and tile. Attached to the cathedral is a grammar school, remodelled by Henry VIII. Part of St. Augustine's Benedictine abbey still remains, with its fine gateway, near the cathedral. It occupied, with its precincts, 16 acres. The old buildings have lately received large modern additions, in order to fit them for the purposes of a missionary college in connection with the Church of England. Another recent institution for

CANTERBURY—CANTHARIS.

education is the clergy orphan school, which occupies a conspicuous position on St. Thomas's Hill, about a mile out of the city. The ruins of a Norman castle, 88 by 80 ft., the third in size in England, stands near the city wall. C. stood, in Roman times, at the union of two Roman roads from Dover and Lympne, the chief seaports of the Romans. C. was the capital of Kent, and the centre from which England was Christianized. St. Augustine, the Apostle of England, sent by Gregory I., was the first abp., and baptized King Ethelbert of Kent. C. was the Saxon *Caer Cant*, City of Kent, and cap. of the kingdom of Kent. The Danes in the 9th, 10th, and 11th c. often ravaged and burned the city. Henry VIII. confiscated the treasures of the cathedral, and Edward VI. levied fresh exactions from it. The cathedral suffered much in the parliamentary struggles, but it has since been repaired.

CANTERBURY: now a provincial dist. of New Zealand, in the South Island; but till 1876 a province, with Christchurch as its capital, and Lyttleton as its port. The dist. was settled 1850 by the Canterbury Assoc., a society of peers, bishops, and commoners interested in the colonization of New Zealand. It has an area of abt. 14,000 sq. m., a coast-line of about 200 m., and is well watered by numerous rivers. Coal (in abundance), iron-ore, fire-clays, and quartz have been discovered in the province, and several coal-mines are in operation. On the e. side of the great range of hills are the far-farmed Canterbury plains, the great sheep district of the colony—'three millions of acres rolling back in gentle rise 40 m., to the foot of the central highlands, watered by 20 rivers, and spreading n. and s. further than the eye can reach. The natural pastures of C. are very fine; and to this circumstance is mainly due the rapid advance in prosperity of the country. Excellent timber grows in the province. In 1881, wheat occupied 208,561 acres, estimated to yield 4,915,298 bushels; oats, 89,280 acres, yielding 2,406,476 bushels; barley, 28,640 acres, yielding 732,345 bushels; potatoes, 6,264 acres, yielding 29,112 tons; area broken up and under crop, 1,307,847 acres. Pop. (1901) 143,041.

CANTHAREL'LUS: see FUNGI, EDIBLE.

CANTHARIS, n. *kăn'thär-îs*, CANTHAR'IDES, n. plu. *-î-dêz* [Gr. *kanthāris*, a small beetle]: genus of insects of the order *Coleoptera*, section *Heteromera*: see COLEOPTERA. It belongs to a family called *Trachelides*, or necked beetles, the head being separated from the thorax by a distinct neck or pedicle, and forms the type of a subdivision of that family called *Cantharidix*, many of the species of which possess blistering properties analogous to those of the common BLISTERING FLY, SPANISH FLY, or BLISTER BEETLE (*C. vesicatoria*). This insect, the best known and most important of the genus, is about an inch long; has a large heart-shaped head, rather broader than the thorax; thread-like antennæ three times longer than the head; a nearly quadrangular thorax; and soft elytra (wing-covers) concealing the abdomen, and of equal breadth

CANTHUS—CANTICLE.

throughout. It is of a bright, glossy, green color. The common blistering fly is found in the s. of Europe, and in the s. of Siberia. It is abundant in Italy, Sicily, and Spain, in the s. of France, and in some parts of Germany and Russia. It is rare in England. The larva is not well known. The perfect insect feeds on the leaves of the ash, privet, lilac, elder, and honeysuckle; and rests on them during the night, the day being its time of activity. It is therefore taken by beating the branches of the trees in the morning or evening, when it is comparatively lethargic, a cloth being spread below to receive the insects as they fall. The gathering of *Cantharides* takes place, in the s. of France, in the month of May. It requires great caution to prevent injury to those who engage in it, the insects emitting a volatile substance with a strong smell, which causes inflammation of the eyes and eyelids, convulsive sneezing, and irritation of the throat and bronchial-tubes, nor can they be handled without danger of blistering. Those who collect them, therefore, generally wear gloves and veils. Unpleasant effects have been experienced from even sitting under trees on the leaves of which cantharides were numerous. Various methods are employed for killing cantharides when they have been taken; the cloths containing them are very generally immersed in hot vinegar and water, and they are afterward carefully dried; sometimes they are killed by the vapor of vinegar, and sometimes by oil of turpentine. Unless kept with great care, they soon begin to lose their active properties, although in stoppered bottles they remain fit for use for years. They are very liable to be injured by mites, and afford a favorite food also to a kind of moth and to some other insects.

CANTHARIDINE, n. *-ĩ-dĩn*, the active principle of the blistering flies, has such powerful blistering properties that $\frac{1}{100}$ th of a grain placed on the lip rapidly causes the rise of small blisters. Administered internally, blistering flies cause heat in the throat, stomach, intestines, respiratory organs, etc.; and if in large doses, they give rise to inflammation of a serious nature, and sufficient to cause death. Externally, they are employed as a *blistering agent*. There are various medicinal preparations of blistering flies, such as *Vinegar of Cantharides*, obtained by macerating blistering flies in acetic acid; *Tincture of Cantharides*, procured by digesting blistering flies in proof-spirit, etc.; but that most commonly employed is *Plaster of Cantharides* or *Blistering Plaster*, obtained by mixing equal parts of blistering flies, yellow wax, resin, and lard. See BLISTER.

CANTHUS, n. *kǎn'thũs* [L. *canthus*; Gr. *kanthos*, the iron ring around a wheel]: the angle or corner of the eye.

CANTICLE, n. *kǎn'tĩ-kl* [L. *canticulum*, a little song—from *can'ticum*, a song, a ballad—from L. *canto*, I sing]: in *OE.*, division of a poem; a canto. CAN'TICLES, n. plu. *-tĩ-klz*, the Song of Solomon, or Song of Songs; the Hymns, Benedictus, etc., in the English Prayer-book. CANTION, n. *kǎn'shũn* [L. *cantiōnem*, a song, a charm]: in *OE.* a song.

CANTICLES—CANTILEVER.

CANTICLES, *kǎn'tî-klz*, or **SONG OF SOLOMON**: a canonical book of the Old Testament, called in Hebrew *The Song of Songs*—i. e., the most beautiful song. The author is commonly supposed to be Solomon, and in the rich luxurious splendor of its coloring, it admirably harmonizes with the 'golden time' of that magnificent monarch. The theme which it celebrates is love; but what kind of love, whether earthly or spiritual, is a question that has perplexed biblical critics. The oldest interpretations are allegorical and are either political or religious. The former of these, considered C. as the symbolical expression of a deep longing for the reunion of the kingdoms of Judah and Israel; the latter, of the love of God for his chosen people, the Jews. The religious interpretation passed over from Judaism to Christianity, and assumed a new aspect in consequence. Origen found the beloved bridegroom in Christ, and the bride in the church or the believing soul. Only among the theologians of the Syrian school do we find an effort made to adhere to more intelligible principles of interpretation, but the 'mystical view' obtained the upper hand, and has continued predominant among orthodox theologians. For a while an attempt was made to distinguish between a primary and a secondary sense, both more or less directly present to the mind of the author; but modern scholarship in the main contents itself with endeavoring to fix the primary or literal meaning. Nor is this easy. Some commentators hold, for example, that C. is an anthology of detached idyls; others argue that it is a dramatic unity composed of connected parts. Ewald has done much to establish the latter view, though he advances a theory, known as the 'shepherd theory,' very different from the traditional theory, which also holds to the dramatic unity of the whole. Ewald's followers hold that the poem was written about the middle of the 10th c. B.C. in a spirit of hostility against the luxurious court of Zion. Solomon, the type of a sensual monarch, has carried off to his harem a northern shepherd maiden, who in the poem appears surrounded by the ladies of his court. The king fails even by the proffer of honorable espousals to overcome the maiden's fervent attachment to her shepherd lover in the north country, and wholly abashed, ceases to press his suit. Finally, true and chaste love triumphs in the union of the peasant lovers.

Against this plausible shepherd theory it is pointed out that it is irreconcilable with the passage iii. 6—v. i., in which a royal marriage is depicted most happily consummated. It also requires an interpolation between iv. 7 and iv. 8. Delitzsch advances other arguments for the traditional view, which is that the poem depicts conjugal love in its purity and sweetness—a type of the marriage of which the Messianic Psalm xlv. sings.

CANTILENE: see **CANTABILE**.

CANTILEVER, n. *kǎn'tî-lěv'ér*, or **CAN'TALEV'ER**, or **CANTALIVER**, or **CANTLIVER** [*cant*, an angle, and *lever*, the supporter of a roof-timber]: in *arch.*, a projecting block or

CANTILEVER BRIDGE—CANTIRE.

large bracket for supporting, as under a balcony, or the eave of a house, or upholding a stairway.

CANTILEVER, or **CANTALEVER**, **BRIDGE**: originally applied to house-building, the term has become better known in its application to the construction of one form of bridge, in which, without central support, two long brackets or arms are built out, one from either bank—each being securely anchored or counter-balanced on the shore, and both brackets meeting in the middle, where the two ends are joined, forming the cantilever span. The best instance of this kind of bridge is the famous cantilever bridge across the Hudson river at Poughkeepsie, N. Y., completed in 1889. It is about the longest double-track railroad bridge in the United States, and the longest in the world, excepting the bridge over the Firth of Forth, in Scotland, opened in 1890. The manner of construction of the cantilever spans of the Poughkeepsie bridge is as follows: false works were first built under the truss spans, upon piles 130 ft. long, driven down into the bottom of the river, over 500 piles being required to each span. These false works were carried up 130 ft. above high water, and upon them was laid a track, upon which a huge traveller, the largest ever built in this country, was placed; then a hoisting engine was hoisted to the floor of the false works, which lifted the steel work into place. When the truss was completed the false works were removed and the piles pulled out, leaving the river unobstructed. The cantilever spans are built out piece by piece over the river without false works or other support from below, the traveller running out upon the portions just erected until the opposite arms are joined together. There are three cantilever spans to the Poughkeepsie bridge, each 548 ft. long and weighing 1,600 tons.

CANTIRE, *kan-tīr'*, or **KINTYRE**, *kin-tīr'* [Gaelic, headland]: long narrow peninsula of Argyleshire, running n. and s. between Arran Isle and the Atlantic, and united at the n. end with the mainland of Scotland by the isthmus of Tarbet, a mile broad between East Loch Tarbet, a small loch or bay of Loch Fyne, and West Loch Tarbet. C. is 40 m. long, and, on an average, $6\frac{1}{2}$ broad. The surface is much diversified by low, undulating, moorish hills, with many lochs. The highest point is Bennear, 1,515 ft. It contains much cultivated land. The n. four-fifths of C., and the s.w. corner round the Mull, or promontory, of Kintyre, consists chiefly of mica slate. Old red sandstone occurs on the s.e. shore. Coal is found between Campbelton and the w. coast. A light-house, 297 ft. above the sea, stands on the Mull of Kintyre. C. includes 10 parishes. Campbelton (q.v.) is the chief seat of population. C. was in ancient times peopled by Picts and Celts more densely than the rest of Scotland. The Scots from Ireland subdued it A.D. 210, were expelled from it 446, but returned 503, under Fergus, the first Scottish king, who fixed his seat at Campbelton. Kenneth II. (MacAlpine), on defeating the Picts 843, removed to For-teviot. From the 8th to the 12th c. C. was occupied by

CANTIUM—CANTON.

Northmen from Scandinavia, afterward by the Macdonalds of the Isles, and more lately by the Campbells. Many burying-grounds and small ruined chapels or monasteries in C., show its former populousness. Near these chapels, and in the villages, are many high, upright slate crosses, with rude figures and inscriptions on them. C. contains many ancient watch or ward forts often vitrified. Pop. abt. 18,000.

CANT'IUM: ancient Roman dist. in Britain, nearly the same as modern Kent.

CANTLE, or CANTEL, n. *kăn'tl* [OF. *chantel*, a cantle, a hunch—from mid. L. *cantel'tus*, dim. of *cantus*, a corner: Icel. *kantr*, a corner]: in *Scot.* and *OE.*, a piece or corner of a thing broken off; a hunch, as of bread; a fragment; the hind bow or protuberance of a saddle: V. to cut in pieces. CANT'LING, imp. CANTLED, pp. *kănt'ld*. CANTLET, n. *kănt'lét*, a broken piece; a cantle.

CANTO, n. *kăn'tō* [It. *canto*, a song: L. *cantus*, singing—from *canto*, I sing]: a part or division of a poem; in *music*, the leading part; a song. CANTO FERMO, in *church music*, plain song, or choral song in unison, and in notes all of equal length; introduced, it is said, by Pope Gregory the Great, before the invention of the modern notation: see also GREGORIAN TONES. CANTILLATE, v. *kăn'til-lăt*, to chant, to recite musically. CAN'TILLA'TING, imp. CAN'TILLA'TED, pp. CAN'TILLA'TION, n. *-lă'shăn*, chanting; reading or reciting with musical cadence.

CANTON, n. *kăn'tôn* [F. *canton*; It. *cantone*—from *canto*, a corner: mid. L. *cantōnum*, a region, a province]: a small division of land; a division of a country, constituting a separate local government or state, as in Switzerland; in France, a subdivision of an arrondissement; in *heraldry*, one of the nine honorable ordinaries, occupying a corner of the shield either dexter or sinister, and in size one-third of the shield: V. to divide into districts or cantons; to allot quarters to troops. CAN'TONING, imp. CAN'TONED, pp. *-tōnd*. CAN'TONAL, a. pertaining to or divided into cantons. CANTON'MENT, n. the part of a town or village assigned to a body of troops; separate quarters for soldiers; in the general operations of European armies, temporary resting-places. Many circumstances, especially the state of the weather and the supply of food, influence a general in determining whether to go into cantonments or to encamp, in the intervals between active operations; or he may take the former course during an armistice. The quartermaster-gen. previously examines the district, and determines how many men and horses to place in each village; arrangements are also made for a main-guard, cavalry pickets, alarm-posts, road-barricades, lines of sentries, mounted orderlies, etc., to guard against a sudden surprise from the enemy. In cantonments the men are not generally under canvas, as described in CAMP. In India, cantonments are *permanent* places, regular military towns, distinct and at some little distances from the principal cities. If on a large scale such a cantonment contains barracks for European cavalry, infantry, and artillery;

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rows of bungalows or houses, each inclosed in a garden, for the officers; rows of huts for the native soldiery; magazines and parade-grounds; public offices and buildings of various kinds; and a bazaar for the accommodation of the native troops.

CANTON, *kàn'ton*: city of Fulton co., Ill., 28 m. w.s.w. of Peoria and 12 m. w. of the Illinois river; at the intersection of the Toledo Peoria and Warsaw railroad with a branch of the Chicago Burlington and Quincy railroad. It has coal mines, iron foundries, manufactories of wagons, farm implements, and cigars; a packing-house, five good school buildings, seven churches, a library, a fire dept., and two weekly papers. Pop. (1900) 6,564.

CANTON: village and township of Norfolk co., Mass., 15 m. s. by w. of Boston, on the Boston and Providence railroad. The Neponset river affords water-power to several cotton, woolen, and silk mills. C. has a bank and several churches. Pop. (1900) 4,584.

CANTON: village and township of Lewis co., Mo., on the Mississippi river, about 185 m. n.n.w. of St. Louis, 17 m. from Quincy, Ill. The Mississippi Valley and Western railroad passes through it. It has a river trade, and contains Canton Univ., a school of the 'Christians' or Disciples, two banks, wagon and plow factories, some other manufactures, and a weekly paper. Pop. (1880) village, 2,632; (1890) 2,241; (1900) 2,365.

CANTON: cap. of St. Lawrence co., N. Y.; on the Rome Watertown and Ogdensburg railroad, 60 m. n.e. of Watertown. Grass river affords water power to manufactures of lumber, flour, leather, machinery, etc. C. contains the county buildings and those of St. Lawrence Univ., Universalist institution, with depts. of law and theology. It has nine churches and a weekly paper. Pop. (1880) 2,049; (1890) 2,580; (1900) 2,757.

CANTON: city and cap. of Stark co., Ohio, on the Pittsburgh Ft. Wayne and Chicago railroad, 102 m. w.n.w. of Pittsburgh, 54 m. s.s.e. of Cleveland. Two branches of Nimishillen creek unite here. C. derives its water supply by a Holly engine from a lake 3 m. n.w. It is the centre of a rich farming country, with abundant coal and limestone near, but relies largely on its manufactures of iron, wool, plows and farm implements, saws, safes, printing-presses, etc. It contains St. Vincent's (Rom. Cath.) College, an academy, six banks, and many churches. Four newspapers are published here. Pop. (1870) 8,669; (1880) 12,258; (1900) 30,667.

CANTON, *kăn-tôn*: large commercial city and port in the s. of China, cap. of the province of Kwang-tung (of which the name C. is merely a corruption). It is in lat. 23° 7' 10" n., long. 113° 14' 30" e.: on the n. side of the Chookeang, or Pearl river, in a rich alluvial plain, 32 m. from the sea. The river (the entrance to which is known by the name of the Boca Tigris, a Portuguese translation of the Chinese *Hu-mun*, 'Tiger's Mouth') is very picturesque. The city is surrounded by a brick rampart 6 m.

in circumference, and entered by 12 gates, to each of which a guard-house is attached. It forms an irregular square, and is divided by a wall into the North and South, or Old and New city. The former is inhabited by the Tartar population, the latter by Chinese; and between the two communication is maintained by four gates in the separating wall. The suburbs are very extensive, and in one of these, facing the river, stood the European factories or *hongs*. Most of the streets of C. are crooked and labyrinthine beyond description, but there are a small number of straight thoroughfares which make it easy for a stranger to find his way. As a rule, a moderately straight street leads from the water-side to each gate of the city on the s. front, and is more or less prolonged through the interior. Many of the streets are devoted to distinct trades; thus, there is 'Carpenter' street, 'Apothecary' street, etc. The joss-houses, chiefly Buddhist temples, are said to be 124 in number. The largest of these, on Honam Island, covers seven acres, and has 175 priests attached. It is called *Hae Chwang Sze*, or 'The Temple of the Ocean Banner.' Another famous structure is 'The Temple of the Five Hundred Gods,' in the w. suburbs. There are also several many-storied towers or pagodas, a Mohammedan mosque, founded about A.D. 850 by the Arabian voyagers, who then were accustomed to visit C., a foundling-hospital, an English and an American missionary hospital. Streets of wooden houses were formerly on the river side, but these were swept away during the late quarrel with Yeh; and one large site that they occupied was walled in for the purpose of erecting new foreign factories, the old ones having been totally destroyed by fire. A very remarkable example of life upon the water is the boat-town of Canton. The *climate* of C. may be pronounced healthful, though the heat from June to Sep. is oppressive, and the thermometer sometimes, though rarely, stands at 100° in the shade. In ordinary years, the winter minimum is 42°, and the summer maximum 96°. The n.e. monsoon commences in Oct., and is the prevailing wind till March, when the s.w. monsoon sets in. Its average temperature is 70½° F., and the annual fall of rain 70.625 inches. The Cantonese are notorious for their turbulence and hatred of foreigners, and the European factories have more than once been attacked by infuriated mobs, who were kept at bay by only force of arms. This hostility may, however, be greatly due to the baneful influence of those in power; for here the government of the mandarins of the present Manchu Tartar dynasty appears to have reached its maximum of corruption and barbarity, and was fitly represented by the notorious Yeh, late gov.gen. of Kwang-tung and Kwang-se. The author of *Twelve Years in China* gives some startling facts illustrative of mandarinic rule in this part of China. After the defeat of the Triad rebels, who besieged C. 1844-5, it is estimated that 1,000,000 of people perished in the province.

The admirable situation of C. for traffic explains how, from an early period, it was a favorite port with foreign

CANTONNÉE—CANTRIP.

merchants. The Arabs made regular voyages hither as early as the 9th c. The Portuguese found their way to it in the 16th c., and were followed by the Dutch a hundred years later. These in turn were overtaken and supplanted by the English before the close of the 17th c., and an immense trade was carried on by the agents of the East India Company. Their monopoly ceased 1834, Apr. 22. Since that date the proceedings of the C. government officers have originated two wars with the British. The city was captured by the allied French and English forces 1857, Dec., and continued to be garrisoned by them till 1861, Oct.: see CHINA. After the treaty of Nankin (signed 1842, Aug. 29) C. was known as one of the five ports; Amoy, Foo-chow, Ningpo, and Shanghai also having been opened to foreign commerce.

The chief exports from C. are tea, silk, sugar; the chief imports, raw cotton, piece-goods, opium, metallic wares, etc. 'War and rebellion' (say the authors of the *Treaty Ports of China and Japan*, Lond. and Hong-kong, 1867), 'the opening of Hankow as a shipping port for tea, and, above all, the proximity of Hong-kong and Macao to the delta of the Canton river, with its unrivalled facilities for smuggling, have robbed C. of the pre-eminence it so long enjoyed in commercial prosperity.' A comparison of the value of the exports and imports for the succeeding 12 years shows that the city for a time steadily recovered ground. In 1877, the total value of exports was \$18,430,000; of imports, \$5,580,000. exclusive of treasure. In 1894, the exports were \$15,700,000, and the imports \$13,700,000. The revenue for 1877 was \$1,590,800; for 1878, \$1,401,000. In 1886, 3,159 vessels of 2,586,689 tons entered and cleared the port. The number of Chinese conveyed between C. and Hong-kong for the year 1878 was 650,000, and 26,000 to Macao. The total taxable trade of the province was estimated by the British consular agent, 1878, as amounting to \$125,000,000. Pop. of city (1894) 2,000,000; (1901) 850,000.

See Mrs. Gray's *Fourteen Months in Canton* (1880); Dr. Gray's *China* (1878); *The Middle Kingdom*, by Dr. S. W. Williams; *The Chinese* by Sir John Davis; Meadows's *Chinese*; *Twelve Years in China* (Edin. 1860); *Report of the Missionary Hospital in the Western Suburbs of Canton*; *Treaty Ports of China and Japan* (Lond. and Hong-kong, 1867).

CANTONNÉE, *kǎng-to-nā'*, in Heraldry: location of a cross when between four other objects, e.g., scallop shells.

CAN'TON'S PHOSPHORUS, or PYROPHORUS, *pī-rōf'-ēr-ūs*: sulphuret of calcium (CaS) obtained by heating in a close vessel three parts oyster-shells and one part sublimed sulphur. This sulphuret takes fire when exposed to or thrown into the air.

CAN'TOR: see PRECENTOR.

CANTRIP, n. *kǎn'trīp*, or CAN'TRAP, n. *-trăp* [Gael. *cean-drip*, a great and mischievous trick—from *ceann*, the head, the chief; *drip*, a snare which traps its author]: in *Scot.* and *OE.*, a magic charm; an incantation; a mischievous trick.

CANTURIO—CANVAS.

CANTURIO, *kán-tó'ri-o*, or **CANTU'**, *kán-tó'*: town of n. Italy, 5 m. s.e. of Como, in the midst of a rich district; has a church with an elegant tower, which served as a beacon during the middle ages, and manufactures of iron-wares. Pop. 5,500.

CANTY, or **CANTIE**: see under **CANT 1**.

CANULA, n. *kăn'û-lă* [dim. of L. *canna*, a reed]: a tube used by surgeons for drawing off fluid from a part of the body.

CANUN, or **KANOON**, n. *kăn-ôn'* [Turk]: an instrument strung with cat-gut, in form like a dulcimer, with which the women in the harem accompany their singing. The sound is brought out by means of plectra-thimbles made of tortoise-shell pointed with cocoanut wood, and worn upon the ends of the fingers.

CANUTE, *ka-nût'*, or **CNUT**, *knôt*, King of England: d. 1035 or '36: succeeded to the rulership of the Danes in England on the death of his father, Swein or Sweyn, and was by them proclaimed king. On the death of Ethelred, he shared the sovereignty with Edmund Ironside, who ruled over the south, while C. was monarch over the north of England. The sudden decease or assassination of Edmund made C. sole ruler 1017, and he reigned till his death. His rule was marked at first by cruelty, but when all who were likely to interfere with his power had been disposed of, he showed mildness and justice, combined with talent and judgment. The Anglo-Saxons, whose complete subjugation he had effected, did not feel their chains; they had experienced no such good government since the time of Alfred and Athelstane. He was easily accessible to all his subjects; and won the hearts of the people by his love for song and ballad, and his liberal patronage of gleemen. One verse of an English song written by C. is still extant. As soon as English affairs were settled, C. superseded his brother Harold as king of Denmark; and in 1028 he extended his dominion over Norway—becoming thus one of the most powerful princes of Europe. In his latter years he was devout.

CANVAS, n. *kăn'văs* [F. *canevas*, canvas—from It. *canavaccio*, canvas, a piece for embroidery: L. *can'nabis*; It. *cannevo*, hemp]: a coarse cloth made of flax or hemp, used for tents, sails, painting on, etc.; in a *ship*, the sails are called the *canvas* (see **SAIL**; **SAILCLOTH**): **ADJ.** made of canvas. **CANVASS**, v. *kăn'văs* [a metaphorical meaning taken from sifting a substance through *canvas*]: to discuss and sift, as a subject or policy; to examine into, to solicit votes or interest; to make interest in favor of: **N.** a close inspection into; discussion; debate; a seeking; a solicitation. **CAN'VASSING**, imp.: **N.** the act of one who canvasses. **CAN'VASSED**, pp. *-văsť*. **CAN'VASSER**, n. *-văs-ér*, one who solicits, as a vote.

CAN'VAS, for Artists' Use: principal material upon which oil-paintings are made. Two kinds are prepared of which the best is called *ticking*. Before it is put into the artist's hands, it is usually *primed*, or grounded (see **GROUND**) of a neutral gray, or other tint, as he may direct. Certain sizes of C. being in greater request than others, are

CANVAS-BACK—CAP.

kept ready stretched on frames. Those used for portraits are known by the names of *kit-cat*, which measures 28 or 29 inches by 36; *three-quarters*, 25 by 30 inches; *half-length*, 40 by 50; *Bishop's half-length*, 44 or 45 by 56; *Bishop's whole length*, 58 by 94.

CANVAS-BACK, *kăn'vas-băk* (*Anthya Vallisneria*): duck of the family *Fuligulinæ*, valued for its flavor above all other waterfowl, and considered by epicures to afford a dish unsurpassed. It is peculiar to N. America, and found chiefly on the bays and estuaries of the sea, though it associates freely with the *Anatinæ* or river ducks. The male is about 22 in. long, with a wing $9\frac{1}{2}$ in.; its head and neck are red; breast and back black and white; wings, tail, and legs, gray, slate-color, and brown. The female is somewhat smaller, and less highly colored. This duck breeds at lat. 50° and further n., and comes s. in Nov. Its excellence as food is attributed to the wild celery on which it feeds in Chesapeake Bay, about the mouth of the Potomac; when found elsewhere, its flesh is not better than that of other wildfowl, and inferior to that of the red-head. It flies high and rapidly, and is usually shot on the wing from behind screens. The breast feathers are so thick and matted as often to resist ordinary shot. These birds have much curiosity, and will swim in numbers toward any unusual object on the shore; because of this habit they are often killed through long screens, dogs, and 'toling,' a method abhorred by true sportsmen.

CANY, a. *kă'nă* [see CANE]: full of canes; consisting of canes.

CANZONET, or **CANZONETTE**, n. *kăn'zō-nět'*, or **CANZONÉ**, *kăn-zō'nă* [It. *canzonetta*, a little song—from *canzona*, a song: L. *cantiōnem*, a song—from *canto*, I sing]: one of the oldest and most prized forms of the Italian lyric. The word is borrowed from the Provençals, whose *cansós* or *chansós*, however, were not restricted to any precise form, but were simply verses intended to be sung. The Italian writers first attempted to regulate the wayward and arbitrary character of the Provençal *cansós*; Dante, and subsequently Petrarch, being especially successful. The *Canzone Petrarческа* or *Toscana* was any considerable lyrical poem, composed of stanzas exactly corresponding to one another in number of lines, measure, and position of rhymes, and which customarily closed with a short stanza. About the end of the 16th c., the Italian writers began to deviate from the strict form of the Petrarchian canzone. Torquato Tasso and Chiabrera are the most notable names in the new movement. The most of the canzones of the latter—called by their author *canzonette*—are written in short lines and stanzas, the position of the rhymes being also completely arbitrary.

CAOUTCHOUC: see INDIA RUBBER.

CAP, n. *kăp* [AS. *cæppe*, a cap: Sp. *capa*; It. *cappa*; F. *cape*, a cover—from mid. L. *cappa*, and *capa*, a hooded cloak]: a cover in general; a cover for the head; the top or highest part; a cover for the head as a mark of some office

CAPABLE—CAPARISON.

or dignity; in *ship-building*, a strong, thick block of wood fixed near the top of each mast; it has a hole to receive the upper end of the lower mast, and another to receive the lower end of the topmast, with eyebolts to aid in hoisting the topmast. There is also a C. of smaller size at the junction of the topmast and the top-gallant-mast. When made of iron the C. is called a *crance*: V. to cover the top end or orifice; to uncover as a mark of reverence or civility; to render complete; to invest with official distinction; in *Scot.*, to complete the admission to academical honors by the ceremony of capping; to contend with or surpass a rival in quoting texts or making verses. CAP'PING, imp. CAPPED, pp. *cap't*. CAP-A-PIE, ad. *kāp'ā-pē'* [F. *cap-à-pie*—from L. *cāput*, the head; *pedem*, a foot]: from head to foot; all over, as *armed cap-a-pie*. CAP'FUL, n., CAPFULS, n. plu. a small quantity, used by sailors when speaking of the wind. CAP-OF-MAINTENANCE, a cap carried before the kings of England at their coronation; worn by noble and royal personages on certain state occasions. CAP-SHEAF, the top sheaf of a stack of corn. TO SET ONE'S CAP AT, to take measures to gain the affections of a man on the part of a woman. CAP IN HAND, with obsequious submissiveness in order to obtain a favor from a great man. CAP OF LIBERTY, a small red cap worn by a former slave as a token of his freedom. PERCUSSION-CAP: see PERCUSSION.

CAPABLE, a. *kā'pī-bl* [F. *capable*—from mid. L. *cāpā-bilis*, that may be taken or comprehended—from L. *capō*, I take]: able to contain or receive; having the requisite mental, moral, or physical ability; qualified for; able to understand; susceptible. CAP'ABLENESS, n. *-bl-nēs*, the quality of being capable. CAP'ABILITY, n. *-bīl'ī-tī*, the quality of being able or qualified for. CAPACIOUS, a. *kā-pā'shūs* [L. *cāpācem*, that can hold much]: roomy; large; that will hold or take in much; extensive. CAPA'CIOUSLY, ad. *-lī*. CAPA'CIOUSNESS, n. power of holding or receiving much. CAPACITATE, v. *kā-pās'ī-tāt* [L. *capacitātem*, capacity]: to qualify; to enable. CAPAC'ITATING, imp. CAPAC'ITATED, pp. CAPACITA'TION, n. *-tā'shūn*. CAPAC'ITY, n. *-ī-tī*, the power of containing; extent of room or space; the power of receiving instruction; ability; profession or occupation.—SYN. of 'capable': qualified; fitted; able; competent; efficient; effective; skilful;—of 'capability': skill; ability; capacity; cleverness; talent; genius; faculty; efficiency.

CAPAC'ITY, LEGAL: such a condition of individuals, in regard to their natural qualities and actual position under the constitution of the country, as fits them for the application of the laws, civil and criminal. Generally speaking, all persons have this legal capacity excepting *aliens*, persons *attainted*, *convicts*, *insane* persons, and to some extent also *infants*, *femmes coverts*, or married women, and persons under *duress*; see these titles. See, also, CONVEYANCE: CONTRACT: PLAINTIFF: PURSUER: DEFENDANT: SUIT.

CAP-A PIE: see CAP.

CAPARISON, n. *kā-pār'ī-sūn* [F. *caparaçon*, caparison

CAPE—CAPE BRETON.

—from Sp. *caparazon*, carcass of a fowl, cover of a saddle
—from Sp. and mid. L. *capa*, a cloak]: an ornamental cover laid over the saddle of a horse: V. to cover with an ornamental cloth, as a horse; to deck; to dress out superbly. CAPAR'ISONING, imp. CAPAR'ISONED, pp.-sünd; in *heraldry*, a war-horse completely furnished for the field is said to be caparisoned.

CAPE, n. *kūp* [F. *capote*, a greatcoat—from *cape*, a hooded cloak (see CAP)]: a cover hanging from the neck over the back and shoulders; the neck-piece hanging over a cloak: a short, loose cloak.

CAPE, n. *kūp* [It. *capo*; F. *cap*, a promontory, a headland—from L. *caput*, the head]: any portion or point of land projecting into the sea beyond the general line of the shore. On a low sandy coast, a cape generally forms an obtuse angle, being merely a change in the trending of the land. On rocky shores, capes usually form acute angles, and are called points, or if high, headlands or promontories.

CAPE ANN: e. point of Essex co., Mass., at n. end of Massachusetts Bay, 31 m. n.e. of Boston; lat. 42° 38' n., long. 70° 34' w. It is a rocky headland of syenite, of which quarries are worked for building purposes, close to the water. The name is given to the whole peninsula forming the town of Rockport and part of Gloucester. Near the end of the cape is the small harbor of Pigeon Cove, where coasting vessels may take refuge from the prevalent n.e. storms. Two fixed lights, 500 yds. apart, on Thatcher's Island, are known as the Cape lights. The peninsula is a favorite summer resort, and its south coast is lined with handsome residences.

CAPE BAB-EL-MANDEB: see BAB-EL-MANDEB.

CAPE BIANCO, *be-ân'ko*: extreme n. point of Africa, on the Mediterranean coast; lat. 37° 20' n., long. 9° 48' e.

CAPE BOEO, *bo-ā'o*: w. point of Sicily, 1 m. from Marsala. The first Punic war closed by a naval victory of the Romans over the Carthaginians off this point.

CAPE BON, or RAS ADDER, *rās ād' der*: point of entrance of the Gulf of Tunis, Africa.

CAPE BRETON, *brēt'on*: rocky island of irregular form in British N. America, between n. lat. 45°—47°, w. long. 59° 30'—61° 30'; 4,376 sq. m. It is separated from the peninsula of Nova Scotia by Chedabucto and St. George's bays and the Gut of Canso. Portions of its coast are bold and impressive, and it has much picturesque scenery. Its principal exports are pine, oak, birch, maple, fish, and coal. Though the island produces maize and other grains, yet it depends for breadstuffs, chiefly on the United States. C. B. originally a French possession, was taken by the English 1745; but being subsequently restored to France it was again captured in 1758, and ceded in 1763. After having been for a time a distinct colony, it now forms part of the province of Nova Scotia. The towns are Sydney, Arichat, and Port Hood, the once famous Louisburg, stripped of

CAPE CANAVERAL—CAPE FAREWELL.

its fortifications, having become merely a village. Pop. about 84,500.

CAPE CANAVERAL, *kă-năv'ér-ăl*: in Volusia co., Fla., on the Atlantic coast: lat. $28^{\circ} 27'$ n., long. $80^{\circ} 33'$ w. It is nearly surrounded by dangerous shoals; a revolving light, 139 ft. above the sea, stands on the n.e. side.

CAPE CHARLES: s. extremity of Northampton co., Va., and of the 'eastern shore', separating Chesapeake Bay from the Atlantic, and 12 m. n. of Cape Henry; lat. $37^{\circ} 7'$ n., long. 76° w. On Smith's Island, n.e. of it, is a lighthouse with a revolving light.

CAPE CLEAR: on s. side of Clear Island, off the s. coast of Ireland, co. Cork. The island is 31 m. long and 1 m. wide, and has a coastguard station, a telegraph station, and a lighthouse whose light is 455 ft. above the sea, in lat. $51^{\circ} 26'$ n., long. $9^{\circ} 29'$ w. Another lighthouse, whose light is 148 ft. high, stands on Fastnett rock, $3\frac{1}{2}$ m. w. of the cape. The cape itself is a rocky promontory, 400 ft. above the sea, and is the point of British land usually sighted first by vessels sailing from America to English ports.

CAPE COAST CASTLE: chief settlement of Great Britain in North or Upper Guinea; lat. $5^{\circ} 5'$ n., long. $1^{\circ} 13'$ w. The place, as its name implies, is defended by the great castle near the water's edge, and by three small forts on the hills behind. C. C. C. was the capital of the gold coast until 1875; when Accra was made the seat of government, as being more healthful. Pop. 10,000.

CAPE COD: properly the n.w. point of the narrow strip of land, which, with a length of 65 m., curves outward to the e. and n. from the southern Massachusetts coast, and forms the s.e. boundary of the great Cape Cod Bay. The whole peninsula also is known as Cape Cod; it was discovered by Gosnold, 1602. Race Point, at the n. extremity, is marked by a revolving light 155 ft. above the sea; lat. $42^{\circ} 3' 40''$ n., and long. $70^{\circ} 14' 48''$ w. It has been proposed to cut the neck of the peninsula by a canal leading to the head of Buzzard's Bay.

CAPE COLONY: see **CAPE OF GOOD HOPE**.

CAPE DISAPPOINTMENT, or **CAPE HAN'COCK**: s.w. point of Washington Terr., in Pacific co., at the mouth of Columbia river; lat. $46^{\circ} 16'$ n., long. $124^{\circ} 2'$ w. It has a lighthouse 40 ft. high, with a fixed white light 232 ft. above the sea.

CAPE ELIZ'ABETH: township of Cumberland co., Me., near Portland. It takes its name from the cape at its s. end, which is 50 ft. above the sea; lat. $43^{\circ} 34'$ n., long. $70^{\circ} 12'$ w. Here are two lighthouses, 300 yds. apart; the lights, one fixed, one revolving, are 140 ft. above the sea. The town, which is almost a suburb of Portland, is a summer resort, and contains a state reform school, 7 churches, etc. Pop. (1890) 5,459; (1900) 887 (part taken to form South Portland since 1890).

CAPE FAREWELL: s. extremity of Greenland; a precipitous headland on a small island of the same name; lat.

CAPE FEAR—CAPE HATTERAS.

59° 49' n., long. 43° 54' w. It has one of the most tumultuous situations on the globe; storms are frequent, a strong current sets round it from e. to w., and it is surrounded from Jan. to Sep. by a body of ice extending sometimes 100 m. out to sea.

CAPE FEAR: s. extremity of N.C., and of Smith's Island, Brunswick co., off the mouth of Cape Fear river; lat. 33° 52' n., long. 78° w. A dangerous shoal, called the Frying-pan, is close by, and a lighthouse stands thereon, 1 m. from the cape.

CAPEFIGUE, *káp-fēg'*, BAPTISTE HONORÉ RAYMOND: 1802–1872, Dec.; b. Marseille; French publicist and historian. He studied law at Aix, and in 1821 went to Paris, to complete his juridical course, but soon betook himself to journalism and authorship. He held a post in the foreign office until 1848. This, however, did not interfere with his amazing activity. Besides contributing extensively to many of the Parisian journals, he 'manufactured' not less than a hundred of volumes of history—not, indeed, intrinsically valuable, but indicating wonderful facility in composition. The best is the *Histoire de la Restauration* (3d ed. 1842). *Les Reines de la Main Gauche* (15 vols.) appeared in 1858–64.

CAPE FLAT'TERY: n.w. extremity of Washington Terr., in Clallam co., separating the strait of Juan de Fuca from the Pacific. A small lighthouse stands on Tatoosh Island, $\frac{1}{2}$ m. off, in lat. 48° 23' n., long. 124° 44' w. Except for Alaska, this is the westernmost point of the United States.

CAPE FLORIDA, *flōr'ī-da*: s. extremity, of Key Biscayne, off the s.e. point of Fla. The island is 7 m. long and 2 wide, and has on the w. end in a grove of cocoa-nut trees a lighthouse with a fixed white light; lat. 25° 40' n., long. 80° 9' w. It was burned by the Indians in the Seminole war.

CAPE GATA, *gá'tá*, or CAPE DE GATTE (Sp. *El cabo de Gata*): s.e. extremity of Spain, on the coast of Granada, bounding the Bay of Almeria on the e. It is a rocky promontory, 13 m. wide and 24 in circuit, and was once a resort of Moorish pirates. Here is the ancient *Promontorium Charide-mi*, the Moorish Kheyran, composed of crystals, spars, and agates. It is called the port of silver, *el puerto de la plata*. The prevalent high winds called forth a sailors' saying, 'At Cape de Gatte take off your hat.'

CAPE GIRARDEAU, *jē-râr-dō'*: city and township of Cape Girardeau co., Mo., on the Mississippi, 120 m. s.s.e. of St. Louis. It is the shipping-place of a fertile region, and exports cotton, plows, and mineral paints. It has St. Vincent's (Rom. Cath.) College, a normal school, a girls' seminary, 7 churches, and 4 newspapers. Pop. (1880) city 3,889; (1890) 4,297; (1900) 4,815.

CAPE HAT'TERAS: dangerously low point of the coast of North Carolina; lat. 35° 14' n., long. 75° 30' w. It forms the eastern extremity of the insular banks of the same

CAPE HAYTIEN—CAPELAN.

name, projecting to within a few miles of the Florida stream, and marking the spot where the coast line abruptly turns from n.e. to due n. Frequent gales and storms add to the dangers from shoals and currents. The shore region is barren and desolate. Near the cape is a light 192 ft. above the sea.

CAPE HAYTIEN, *hā'te-ěn* (formerly called *Cape Français* and *Cape Henri*): seaport town on the n. coast of the island of Hayti; lat. $19^{\circ} 40'$ n., long. $72^{\circ} 54'$ w. It is pleasantly situated on a small bay, partly encircled by hills, has wide and well-paved streets, and some handsome squares. A great portion of it, however, is in ruins, the effects of the revolutionary wars at the end of last century. Safe anchorage is found within the harbor, which, however, is rather difficult of access. C. H. has considerable trade with the United States. Pop. est. (1901) 29,000.

CAPE HENLOPEN, *hěn-lō'pen*: at the s. extremity of Delaware Bay, in Sussex Co., Del.; 13 m. s.s.w. from Cape May; lat. $38^{\circ} 46'$ n., long. $75^{\circ} 6'$ w. It has a stone lighthouse with a fixed white light, 128 ft. above the sea. The name is Dutch, and means to run in or enter.

CAPE HEN'RY: at the s. extremity of Chesapeake Bay, in Princess Anne co., Va., 12 m. s. of Cape Charles; lat. $36^{\circ} 55'$ n., long. 76° w. It has a fixed light, 120 ft. above the sea.

CAPE HORN, *hawrn*, or HOORN, *hōrn*: most southerly point of America, terminating an island of its own name, in the archipelago of Terra del Fuego; lat. $55^{\circ} 58' 40''$ s., long. $67^{\circ} 16'$ w. It has a perennially antarctic climate, and is merely a detached link, bare and rugged, of the chain of the Andes. It was discovered 1610, by Schouten, a native of Hoorn in Holland, about 90 years later than the Strait of Magellan, which is about 200 m. n. of it, and since then the course of sailing vessels has been round the cape instead of through the strait. Of late years, however, steam vessels find the strait preferable.

CAPE LA HAGUE, *lá hāg* or *lá ág* or *lá hāg*: promontory of France, the n.w. extremity of the peninsula of Cotentin, in the dept. of Manche. It juts out into the English channel, opposite the island of Alderney, and about 16 m. n.n.w. of Cherbourg, and 50 m. s. of St. Alban's Head in Dorsetshire.

CAPE LA HOGUE: often confounded with Cape la Hague, is on the e. side of the same peninsula. Here the united English and Dutch fleets defeated the French 1692.

CAPELAN, *kăp'e-lan* (*Mallotus Grœnlandicus*): small fish of the family of *Salmonidæ*, extremely abundant on the coasts of Newfoundland, and much used as bait in the cod-fishery. It is also, in a dried state, an article of commerce. Its flavor, which is very agreeable, suggests its alliance with the herring rather than the salmon family. It is nearly allied to the smelt, but the teeth are smaller and more numerous. It is the only known species of its genus.—Shoals of capelins arrive periodically on the coast

CAPE LIVERPOOL—CAPE MATAPAN.

of Newfoundland, the vast numbers changing the very color of the sea. Spelled also CAPELIN.

CAPE LIVERPOOL: a headland of the entrance to Lancaster sound, British N. America, s. side.

CAPE LIVERPOOL: headland at the inlet of Liverpool bay, in the Arctic ocean, N. America, s.w. of Cape Bathurst; lat. abt. 70° n., long. 129° west.

CAPELLA, *ka-pěl'la*: bright star of the first magnitude, on the left shoulder of Auriga. C. is also called Capra or the *She-goat*, a name also sometimes given to Capricorn.—The poets fable C. to be Amalthea's goat, which suckled Jupiter in his infancy.

CAPELLA: see A CAPELLA.

CAPELLA, *ká-pel'lá*, GALEAZZO FLAVIO CAPRA: 1487–1535; b. Milan: Italian historian. He was sec. of state to Francis Sforza, Duke of Milan, and orator to the emperor Maximilian and subsequently to Charles V. Among his writings are a *History of the Wars of the Milanese from 1521–1530*, and a *History of Francis Sforza* (1535). He was intrusted with important diplomatic missions.

CAPELLA, *ka-pěl'la*, MARTIANUS MINEUS FELIX: learned author in the second half of the 5th c.; born in Africa, but where is not ascertained. Of his life nothing whatever is known. The work which has preserved his name to posterity is the *Satiricon*, a kind of encyclopædia, highly esteemed during the middle ages as a work of reference. It is written in a medley of prose and verse, and is full of curious learning, but has no literary value; the style has all the bombastic pomp of the African school of later Latinists. It comprises nine books. The first two consist of an allegory, *The Nuptials of Philology and Mercury*, while the remaining seven are devoted to the 'liberal arts,' grammar, dialectics, rhetoric, geometry, arithmetic, astronomy, and music. The first edition of the *Satiricon* appeared 1499, under the care of Franciscus Bodianus; the best in 1836, under the care of U. F. Kopp.

The book on astronomy is remarkable as containing a hint of the true theory of the solar system. Mercury and Venus are there declared to move round the *sun*, and not round the *earth*; and their relation to these bodies is properly explained. Now, as Copernicus knew C., and quotes from him, it is not unlikely that he derived the first idea of his doctrine from this writer.

CAPE LOOK'OUT: s. extremity of an island inclosing Core Sound on the coast of Carteret co., N. C., 85 m. s.w. of Cape Hatteras; lat. $34^{\circ} 37'$ n., long. $76^{\circ} 31'$ w. It divides Onslow Bay from Raleigh Bay. It has a lighthouse with a fixed white light, 100 ft. above the sea.

CAPE MATAPAN, *má-tá-pân'*: s. extremity of Greece, extending into the Mediterranean; lat. $36^{\circ} 23'$ n., long. $22^{\circ} 29'$ e. The ancient name *Tanarum* or *Promontorium Tænarium* applied not only to this headland but to the peninsula; both were sacred to Neptune, the remains of whose temple, near the cape, are still visible. It was a sanctuary

CAPE MAY—CAPE NORTH.

for the Greeks. Here was a cavern, supposed to be one of the entrances of Hades, and here dwelt a fabulous serpent, killed by Hercules.

CAPE MAY: s. extremity of N. J., in Cape May co., at the entrance of Delaware Bay; named from Cornelius Jacobse May, who visited this region 1623, and called Cape Henlopen Cape Cornelius. At its s.w. point is a lighthouse with a revolving light, 152 ft. above the sea, lat. $38^{\circ} 55'$ n., long. $74^{\circ} 57'$ west.

CAPE MAY, or CAPE ISLAND, or CAPE CITY: city of Cape May co., N. J., occupying an island of some 250 acres, separated from the mainland by a small creek. It has long been famous as a watering-place, having a noble beach over five m. long, and bathing facilities probably unsurpassed in the world. There are many hotels, some of great size, and numerous boarding-houses and private cottages. By the West Jersey railroad it is 81 m. from Philadelphia; by the Delaware river and bay the distance is abt. 100 m. Steamboats run daily in the season. The town has two weekly newspapers: its life and prosperity come from the summer visitors. Permanent pop. (1880) 1,699; (1890) 2,136; (1900) 2,257.

CAPE MENDOCINO, *měn-dō-sē'nō*: w. point of Cal., in Humboldt co. It has an iron lighthouse, with a white revolving light, 428 ft. above the sea; lat. $40^{\circ} 26'$ n., long. $124^{\circ} 23'$ west.

CAPE NOME: a cape, city and center of a rich gold mining region, extending from the s. face of the peninsular projection of Alaska. The cape separates Bering Sea on the s. from Kotzebue Sound on the n., and ends on the w. at Cape Prince of Wales, the extremity of the North American continent. The Nome district as settled centers around the lower course of the Snake river, a winding stream which empties into the sea about 13 miles w. of Cape Nome proper. The first discovery of gold was made 1898. Sept., by a number of Swedes, who found it in the ravines and creeks. It was not until 1899, July, that the beach gold was discovered. In the middle of the following Oct. there were 5,000 inhabitants in Nome City, all living in tents on what before was barren shore. The rapidity of the development of Nome City has probably never been equalled. The region is entirely within American boundaries. Early prospecting indicated that it would rival the celebrated Klondike fields in richness. The Cape Nome region, 1901, yielded \$7,000,000 in gold, and in the first ten months of 1902 the output was \$5,008,980.

CAPE NORTH: promontory in the Arctic Ocean, noted as the most northerly point of Europe. It consists of a long stretch of steep rocks, jutting into the sea and reaching a height of 1,200 ft., the top showing a large area of table land and a series of picturesque pyramidal peaks. It forms the n. extremity of Mageröe island, which is separated from the mainland of Norway by a narrow channel; lat. $71^{\circ} 10' 12''$ n., long. $25^{\circ} 46'$ east.

CAPE OF GOOD HOPE.

CAPE OF GOOD HOPE: popularly regarded as the most southerly promontory of Africa, though it is half a degree n. of Cape Agulhas. The latter is merely a projection on a coast line, which diverges inconsiderably from a parallel; but the Cape of Good Hope is really the turning-point from s. to e. on the voyage from Europe to India. This celebrated promontory is in lat. $34^{\circ} 22'$ s., and long. $18^{\circ} 29'$ e., being the termination of Table Mountain, which, as it recedes toward the bay of its own name, rises from the height of 1,000 ft. above the sea to that of 3,582 ft. The Cape (for so it is called by way of eminence) was discovered and doubled by Diaz, a Portuguese navigator, as early as 1486—six years before Columbus, aiming at the same goal by a different route, led the way to America. But it was only in 1497 that Vasco da Gama realized the value of Diaz's discovery, by rounding it on his adventurous voyage from Lisbon to Calicut. The result was not merely to open a new channel for the traffic of the East, but also to transfer trading superiority from the republics of Italy to the states of western Europe.

CAPE OF GOOD HOPE: British colony, so called from the cape on its s.w extremity. It was established by the Dutch, 1652, some attempts at a settlement having been previously made by the Portuguese. The Dutch at first intended it as only an intermediate station between Holland and their East Indian possessions, and occupied only a small tract of ground on the slopes of Table Mountain, with some portion of the adjoining flats; but they had in their neighborhood scattered tribes of improvident natives, singularly feeble of purpose, and incapable of organization on a large scale. The tide of immigration set in from Holland, and when the country was finally taken possession of by the British in 1806 (there having been a brief British occupation, 1796–1803) the Dutch had extended their dominion as far to the e. as the mouth of the Great Fish river, and from that point in a waving line across the country to the w., a little south of Orange river.

In entering upon the government of this large territory, the British found themselves face to face with a race of a totally different sort from that of the purposeless Hottentot—a people styled Kafirs, of the great Bantu stock, consisting of tall, athletic, finely-formed men, of warlike disposition, with incurable propensity to steal from any one not of their own tribe, particularly from a foreigner. The inevitable result was a succession of wars in 1812, 1819, 1828, 1835–6, 1846–7, 1851–2.

Cape Colony proper is bounded on the n. by the Orange river and the Kei. But of late the area of this British possession has been greatly extended by the annexation of districts northward. Of these successive annexations the most important are that of British Kaffraria (see KAFFRARIA) 1866; of Basuto-land, lying in the upper basin of the Orange river, 1868; of two vast districts across the Kei called Fingo-land and No-man's-land, now called Griqua-land East (q.v.), 1875; of Griqua-land West, 1876; and of the Transvaal (q.v.) 1877, restored to the Boers,

CAPE OF GOOD HOPE.

1881, though remaining under British suzerainty. The area of Cape Colony proper is 191,416 sq. m. Pop. (1891) 619,547. The area of the whole colony, with the newly incorporated districts (excluding the Transvaal), was (1891) 376,987 sq. m.; pop. est. (1901) 2,433,000.

The highest range of mountains within the colony is 9,000 ft. above the sea. The mountains keep at a distance from the coast line of from 30 to about 100 m., and receive different names in their course, such as the Stormberg, Sneeuwberg, Nieuwveld, Roggeveld, and Kamiesberg. Between this principal range and the sea on the e. there are two other ranges less continuous and regular.

South Africa being not far from the region of the trades, s.e. winds prevail, especially in summer; the only other wind is from the n.w., which prevails during the colder months. But whichever of these two winds predominates—the one bearing a supply of rain from the Indian Ocean, the other, less frequent, but more richly laden from a part of the Atlantic nearer the line than the country which it fertilizes—it fails to deposit its stores on the opposite side of the principal water-shed which crosses its path. Hence the curious fact of the transposition of seasons in the same latitude. As the harvest in such latitudes depends more on the supply of rain than anything else, people on one side of the country are reaping while those on the other are sowing and planting. Certain parts of the country are liable to long-continued droughts, because while very heavy rain-falls take place, the rain is confined to a particular part of the year. The country, however, is admirably adapted for the storage of water. In many places are the successive beds of dried-up lakes, with a narrow outlet at the lower ends, through which a periodic stream flows. By closing up this outlet artificial lakes or dams may be formed to almost any extent, and of unlimited number; and from the steepness of the slope, the lands lower down admit easily of being laid under water.

As regards minerals, the diamond fields are in Griqualand (q.v.), till recently beyond the limits of the colony, and in the Free State. In 1874, the lieut. of West Griqualand issued an order for the better management of diggings and mines of precious stones and minerals, in which he requires that miners shall have a certificate, dealers a license, and the mines be under official inspection. This ordinance created a great outcry of opposition by a large body of dealers; but it seems necessary that such protection should shield the weak and the dealer who wishes to trade according to recognized law. The discovery of gold (1886) caused a rush to the Transvaal; coal is said to abound in the Stormberg mountains, but the only mineral which has greatly added to the wealth of the colony is the rich copper ore found in Namaqua-land.

There is in the colony almost a total lack of navigable rivers, but the system of railways is rapidly extending. In 1901 there was a mileage of about 8,000 m. open for traffic, the existing lines being mainly connected with three systems—the Western, starting from Cape Town;

CAPE OF GOOD HOPE.

the Midland, from Port Elizabeth; and the Eastern, which starts from East London. The railways all are the property of the government. Direct telegraphic communication with Europe was established 1879, by the E. African submarine cable from Aden to Natal, and thence by the land lines. The shipping at Cape Town is now secured by a breakwater and an extensive system of docks. Works are in progress at Port Elizabeth, East London, and the Kowie for protecting these also from the fierce s.e. winds.

This attractive country is at present occupied by an assemblage of varied races. The Portuguese were the first Europeans who landed here. The Dutch are probably still the most numerous, notwithstanding the exodus to the Orange River Colony, prompted by the slave question. Next in number are the English, by whom some parts of the country, particularly in the east, are occupied almost exclusively. The French also are largely represented, many refugees having settled in it subsequently to the revocation of the Edict of Nantes, but they are now nearly absorbed in the Dutch population. They were at first located principally in the w., where they introduced the culture of the vine, but their names are now found in almost every part of the land. There is also a considerable importation of Germans, who have been settled on the frontiers adjoining the Kafirs for defensive purposes. As regards the colored inhabitants, large numbers of Kafirs have been retained in the districts which they formerly occupied, and others have come into the country as shepherds and servants. There is a large number of people of Malay origin in and around Cape Town, and in towns on the e. coast, who gain a livelihood as fishermen, porters, and in the more laborious sorts of skilled labor. There are a few Mozambiqueres and Hottentots, besides a number of half-castes, to whom the name of Africander properly belongs.

The constitution of the country, after several changes, was fixed in its present form, by an act passed by the colonial legislature 1872, which provides for responsible government. The confederation of the s. African colonies, so as to include Natal, has been long aimed at, but not yet accomplished. The organized part of the Cape Colony is divided into 7 provinces, and between 30 and 40 districts. There are two elective chambers, elected by colonists having a certain property qualification or a specified annual income. The legislative council consists of 23 members, some elected for 10 and some for 5 years. The house of representatives numbers 95 members, chosen for 5 years. The British crown, which appoints the gov., retains the right of veto on all legislation. The administration is vested in an executive council, composed of the gov., the lieut. gov., and a ministry of 5 members—the colonial sec., the attorney-gen., the treas. gen., the commissioner of crown lands and public works, the sec. for native affairs. The supreme court, which has its sittings in Cape Town, has two judges besides the lord chief-justice. Another court holds its sittings in

CAPE ORTEGAL—CAPE RACE.

Graham's Town, in which there are two judges only, but there lies an appeal to the supreme court. In other parts of the colony, justice is administered by the judges going on circuit. A colonial university has recently been founded.

Wool is the staple product of the colony; ostrich farming and the culture of the vine are carried on. The following tables show the exports and imports of the colony:

	Imports.	Exports.
1886....	£3,970,811	£7,306,538
1887....	5,771,543	7,922,957
1888.....	7,013,885	8,964,449
1889 ..	10,841,454	9,829,900
1901.....	21,415,160	10,719,779

The Cape Colony is not exceptional in showing a decline in imports and exports in 1877; but the insecurity caused by the troubles ending in the Zulu war of 1879 has hindered the prosperity of the colony. The official tables include in the returns of revenue also the loans raised by the government; the increase since 1873 is accordingly not to be regarded as normal. Public debt 1901, Jan. 1, £31,393,435.

	Revenue	Expenditure.
1870	£831,211	£795,695
1873.....	2,078,220	2,159,758
1875.....	2,246,179	2,272,275
1880 ..	3,541,720	3,742,665
1901.....	9,072,775	10,150,000

CAPE ORTEGAL, *ôr-tā-gál'*: n.w. extremity of Spain, prov. of Coruña, lat. 43° 45' n., long. 7° 56' w. It is a rugged promontory extending into the Bay of Biscay, or dividing it from the Atlantic, in the roughest and most barren part of the Spanish coast.

CAPE PALMAS, *pāl'mūs* or *pāl'mās*: s. extremity of Liberia, on w. coast of Africa; lat. 4° 22' n., long. 7° 44' w.; a high point with a lighthouse. The name is also applied to that region, which, under the appellation of Maryland, is one of the states of the Liberian republic. Colored emigrants were sent there, 1834, by the Md. Colonization Soc. The American Prot. Episc. Church supports a missionary bp. of C. P. and parts adjacent, Samuel D. Ferguson, D.D., consecrated 1885.

CAPE PRINCE OF WALES: westernmost point of the American continent, in Alaska, on Behring Strait, just below the Arctic circle; lat. 66° n., long. 168° w. It ends in a peaked hill, and is dangerous to navigators by reason of a shoal stretching northeast.

CAPER, v. *kū'pēr* [L. *caper*, a goat: It. *capriolare*, to leap about as kids—from *capriolo*, a kid; *capro*, a buck: F. *capriole*, a caper in dancing]: to leap, skip, or jump; to prance; to spring: N. a leap; a skip, as in dancing; a leap in sport, as a goat or lamb. **CA'PERING**, imp.: **ADJ.** leaping; skipping. **CA'PERED**, pp. *-pērd*. **CA'PERER**, n. *-pēr-ēr*, one who. **TO CUT CAPERS**, to dance in a frolicsome manner; to play pranks.

CAPE RACE: s.e. extremity of Newfoundland, in the section called Ferryland; lat. 46° 40' n., long. 53° w. It is the first point of American land seen in crossing from England, and dangerous in foggy weather. It has a revolving light, established by the British government, and sup-

CAPERCAILZIE.

ported by a tax on all vessels passing between Great Britain and Canada or the United States.

CAPERCAILZIE, n. *kā'per-kāl'zī* [Gael. *capal-coille*, the horse of the wood—from *capall*, a mare; *coille*, a wood]; called also, CAPERCAILLIE, or WOOD-GROUSE, or COCK OF THE WOODS (*Tetrao Urogallus*): largest of the gallinaceous birds of Europe. It is a species of grouse (q.v.), equal in size to a turkey; the male is the largest with white; the chest is of a shining dark green; there is a small scarlet patch of naked skin above the eye, and the bill is whitish. The general color of the female and of young males is dark brown, freckled with yellowish brown; the front of the neck and the chest are yellowish chestnut; and the feathers of the under parts are generally edged with white. The C. has the feet feathered to the toes, but the toes are naked. It is an inhabitant of pine-woods; feeds on berries, seeds, worms, insects, etc., and on the young shoots of the pine, greatly preferring the Scotch fir to the spruce; occasionally also eating, at least in winter, the buds of the birch and other trees. The female makes her nest on the



Capercaillie.

ground and lays from six to twelve eggs, of a pale reddish or yellowish brown, spotted with other shades of brown, and more than two inches long. Like the black-cock, the C. is polygamous.—The geographical distribution of the C. is very extensive: it is found on the pine-covered mountains of all parts of Europe, from Spain and Italy almost to the North Cape, and is abundant in northern Asia. It was at one time found both in Scotland and Ireland, but was completely extirpated about the end of the 18th or beginning of the 19th c. Through the exertions, however, of the Earl of Fife and other proprietors of great highland estates, but particularly of the Marquis of Breadalbane, it has again been restored to the forests of the highlands of Scotland. The C. is very capable of domestication, and breeds readily, if allowed the range of a space containing a few pine trees. It is much esteemed for the table. The market of Stockholm is well supplied with it in winter; and since the establishment of steam communication, the C. has been

CAPE RIVER—CAPERS.

regularly imported into London. See Brown's *The Caper-caillie in Scotland*, 1879.

CAPE RIVER: properly *Vaunks*, taking its popular name from the proximity of its mouth to Cape Gracias a Dios, on the e. reach of the Mosquito shore in Central America. After a generally n.e. course of nearly 300 m., it enters the Caribbean Sea, about lat. $14^{\circ} 59'$ n., and long. $83^{\circ} 11'$ w. being navigable for a considerable distance upward.

CAPERNAUM, *ka-pér'na-üm*: meaning 'the field of repentance,' or 'city of comfort': a favorite and exalted city in the time of Christ, and one of the three which he upbraided 'because they repented not.' It was on the n.w. coast of the Sea of Galilee, and its supposed site is now a heap of ruins, extending more than a mile along the shore and back toward the mountains, so overgrown with grass and bushes that it is difficult to move among them. The few notices of its situation in the New Test. do not enable us to assign its exact position. Thus the doom which the Lord Jesus pronounced against it has had fulfilment: so completely has it been 'cast down' that not even ecclesiastical tradition—so forward with its conjectures—has ventured to fix its site. There is warm dispute between the two most probable spots: *Khan Minyeh*, and *Tell Hâm*, 3 m. north, not far from where the river Jordan enters the Lake of Galilee.

CAPERS, n. plu. *kā'pèrz* [F. *câpre*—from L. *cappāris*, the caper-plant; Ar. *algabr*, the caper]: pickled flower-buds of the caper or caper bush (*Capparis spinosa*). They have an agreeable pungency of taste, with a slight bitterness, and



Caper (*Capparis spinosa*).

have long been in general use as a condiment and ingredient of sauces. They possess medicinal properties, being antiscorbutic, stimulant, and laxative. They are of a grayish green color, to improve which, however, copper is sometimes used, as in the case of gherkins and other pickles, rendering them poisonous. This can be detected by thrusting a polished iron rod into the vessel which contains the C.; the surface of the rod soon becoming coated with copper, if it is present.—The caper-bush is a native of the s. of Europe, and other countries near the Mediterranean. It is extensively cultivated in some parts of the s. of France and in Italy, but most of all in Sicily. It thrives in the open air even at Paris, but in Britain requires artificial heat. It is a trailing, ram-

bling shrub, loving dry places, and often growing on rocks or walls, adding a fresh charm of beauty to many an ancient ruin. It begins to flower early in summer, and cor-

CAPERS—CAPE ST. VINCENT.

tinues flowering till winter. The buds are gathered every morning, and are immediately put into vinegar and salt: at the end of the season they are sorted according to their size and color, the greenest and least expanded being the best, and are again put into vinegar, the finest being sent to the market in bottles, the coarser in small barrels. The fruit, which is a small berry, is also pickled in the s. of Italy. The flower-buds of the caper of Mount Sinai (*Capparis Sinaica*) are pickled like those of the common species; the seeds are also pickled, and are called by a name signifying mountain pepper. The fruit of *Capparis aphylla* is made into a pickle in India. Species of *Capparis* are numerous in India, the warm parts of America, etc. See CAPPARIDÆ. Various substitutes for C. are sometimes used, as the flower-buds of the marsh marigold (*Caltha palustris*), of the Indian cress (*Tropæolum majus*), and of the bean caper (*Zygophyllum Fabago*).

CAPERS, *kā'pērz*, WILLIAM, D.D.: 1790, Jan. 26—1855, Jan. 29; b. St. Thomas' parish, S.C.: Bp. of the M. E. Church, South. He graduated at South Carolina College 1808, and at once entered the S. C. Conference; was missionary to the Indians of w. Ga., presiding elder at Charleston 1825-31, and editor of the *Wesleyan Journal*; was sent to England 1828 as delegate to the Wesleyan Conference; became prof. of evidences of Christianity in Univ. of South Carolina 1835; edited the *Southern Christian Advocate* 1836-40; was a missionary sec. of the M. E. Church, 1840-44, and supt. of colored missions in the south 1844. He took part in the general conference of 1844, which resulted in the division between the n. and s. M. E. Church, and was elected bp. of the M. E. Church, South, 1846. C. wrote *Catechisms for the Negro Missions*, *Short Sermons* and *True Tales for Children*, and an autobiography, included in Wightman's *Life* of him. He died at Anderson, South Carolina.

CAPER-TEA, n.: a kind of black tea-shrub, of which the caper-congou and scented caper are two varieties.

CAPE SABLE: s. extremity of the mainland of Fla.; lat. 25° 6' n., long. 81° 9' w.; the location of Fort Poinsett. The ground is low and sandy; on the n. is the Mangrove swamp.

CAPE SABLE: s. extremity of Nova Scotia, a rocky point on C. S. Island, in Shelburne co. lat. 43° 26' n., long. 65° 38' w. It has a lighthouse. The island is connected with the mainland by a ferry. Its 2000 inhabitants are mostly fishermen, descended from loyalists who left the United States during the revolutionary war.

CAPE ST. VINCENT, *vīn'sēnt*: headland, the s.w. extremity of Portugal; lat. 37° 2' n., long. 9 w., noted for two naval battles in which British ships were engaged near it, 1693 and 1797. In the former, Admiral Rooke, who with some 20 English and Dutch men-of-war was convoying a fleet of some 400 merchantmen, was attacked off this point by the French Admiral De Tourville, and after a running fight lost several ships and 80 merchantmen. In 1797, Feb., Sir John Jervis. with a fleet of 15 sail, gave

CAPE SAN LUCAS—CAPETIAN DYNASTY.

battle to a Spanish fleet of 27 sail of the line, and defeated them, capturing four ships and driving the rest into Cadiz Bay, where they were blockaded.

CAPE SAN LUCAS, *sân lô'kās*: s. extremity of Lower Cal., dividing the Gulf of California from the Pacific; lat. $22^{\circ} 44'$ n., long $109^{\circ} 54'$ w. It forms the lower side of a bay on which stands the town of St. Joseph, 20 m. east.

CAPE SAN ROQUE, *sân rōk* or *rō'kā*: promontory on n.e. coast of Brazil, province of Rio Grande do Norte, 50 m. n. of Natal; lat. $5^{\circ} 28'$ s., long. $35^{\circ} 16'$ w. Owing to the sudden turn of the coast here from a direction nearly n. and s. to one almost e. and w., it is the most prominent object (on the map) on the shore line between Terra del Fuego and Yucatan.

CAPE SPARTIVENTO, *spār-tē-vēn'tō*: promontory of Calabria, in s. Italy, nearly at 'the toe of the boot;' lat. $37^{\circ} 57'$ n., long. $16^{\circ} 5'$ e. It was the ancient *Promontorium Herculis*. Strabo called it the southernmost point of the Italian mainland, but that point is really between C. S. and Cape Leucopetra or Capo dell' Armi.

CAPETIAN DYNASTY, *ka pē'shī-an dī'nas-tī*: third Frankish dynasty, founded about the close of the 10th c., when Hugo Capet ascended the throne. The surname CAPET has been derived from *cappetus*, 'a monk's hood,' because, though duke of France, Hugo was also abbot of St. Martin de Tours. On the death of the last Carolingian monarch (Louis V., surnamed *Le Fainéant*—i.e., the Slothful), Hugo, the most powerful of French vassals, seized the throne, and by moderation and prudent concessions made to the authorities of the church, as well as to his brother-nobles, who had made themselves independent, contrived to retain the power he had seized. He was crowned at Noyon 987, July 3. In order to establish his dynasty, Hugo caused his eldest son Robert to be crowned as co regent, 988. Capet first made Paris the capital of France. He died 996.

Hugo's son ROBERT, a well-disposed but feeble ruler, ascended the throne at his father's death; he died 1031, beloved by his domestics, but despised by his neighbors and vassals, forgotten by his people, and having permitted all power to vanish from his hands. It was during his long lethargic reign that the towns and cities of France began to form themselves into corporations, to act in their own name, to contract obligations, and lay the foundations of middle class freedom. In many other ways, also, the happy dissolution of royal power laid the basis of national prosperity.

Robert's sons were HENRY, who succeeded him, and Robert, ancestor of the older house of Burgundy.

Henry left two sons—PHILIPPE I., who ascended the throne, and Hugo, who distinguished himself in the first crusade (1096), and died 1102. Philippe, under the regency of Baldwin, Count of Flanders, came to the throne when only eight years old, and first really began to reign after the death of the regent (1066). He took hardly any part in the great movements, and events of his times, but supported

CAPETIAN DYNASTY.

Robert, son of William the Conqueror, in his rebellion against his father. Consequently, William commenced an expedition against Paris, and would probably have dethroned Philippe, but died in 1089. By his dissolute course of life, Philippe fell under a sentence of excommunication issued by Pope Gregory VII., 1094, and, after doing penance, died 1108.

His successor, Louis VI., surnamed *Le Gros*, had, during Philippe's lifetime, been active in the support of the crown, and now extended the royal power which had been almost entirely confined within the duchy of Paris. By bold and vigorous measures he brought everywhere his vassals into real subjection to his authority, liberated the towns from baronial oppression, partly abolished feudal bondage, and extended considerably the jurisdiction of the crown. His life was an almost incessant contest with the small and turbulent vassals who had rioted in the license afforded them by the weakness of his predecessors. He died 1137, leaving a numerous family.

As his eldest son and coregent, Philippe, had died during the reign of Louis, his second son, Louis VII., *le Jeune*, now came to the throne, and by the marriage with Eleanor of Guienne, heiress of the Duke of Aquitaine, gained considerable accession to the power of the crown. He engaged in the second Crusade, and led 100,000 men to the east; but was unsuccessful, and returned to France after an absence of two years. In 1152 he divorced his unfaithful wife Eleanor, who subsequently married Henry Plantagenet, afterward Henry II. of England. This marriage made Henry far more powerful than the king of France, and Louis would probably have lost his crown had not the disturbances in England—the quarrels with Becket and with his own sons—proved sufficient to occupy Henry's attention. Louis *le Jeune* died 1180.

PHILIPPE AUGUSTE (q.v.), his son by a third marriage, ascended the throne ten months before his father's death, and proved himself the most able ruler of the Capetian dynasty. Against the wishes of his family, he married Isabella of Hainault, great-granddaughter of the last of the Carolingians, and thus finally united the two houses.

His successor, Louis VIII., who died 1226, was said to have been poisoned by the Count of Champagne, paramour of the queen, Blanca of Castile.

Louis VIII. was followed by his son Louis IX. (SAINT LOUIS, q.v.), who died at Tunis, 1270. Of the eleven children of St. Louis, the eldest, Louis, died aged 16 years, while the youngest, Robert, became the founder of the Bourbon dynasty (see *BOURBON*).

The second son, PHILIPPE III., *le Hardi*, succeeded his father, and by the decease of two brothers and two uncles, acquired possession of Poitou, Auvergne, and Toulouse. His son (Philippe IV., *le Bel*) acquired by marriage Champagne with Navarre. These acquisitions, and his attempt to secure for his uncle, Charles of Anjou, the throne of Naples, involved Philippe III. in contentions with Italy

CAPE TITMOUSE—CAPE TOWN.

and Spain. He subjugated Navarre, 1276, and died of the plague 1285.

PHILIPPE IV., *le Bel*, succeeded to the throne when 17 years old. He soon gave signs of a despotic character, plundered the estates of the church, defied papal authority, persecuted the order of Templars (q.v.), and removed the residence of the pope to Avignon. The atrocious act of burning the grand-master, with 60 knights, of the order of Templars, after they had recalled all the confessions drawn from them by torture, has left an ineffaceable blot on the name of Philippe le Bel. He died 1314, and left three sons and a daughter.

The eldest son, LOUIS X., *le Hutin*, who ascended the throne, displayed remarkable weakness of character, and died 1316.

He was succeeded by PHILIPPE V., *le Long*, second son of Philippe le Bel, who died without issue.

By his death (1322) the crown came to CHARLES IV., *le Bel*, third son of Philippe le Bel, and the last of the direct line of the Capetian kings. He died 1328, leaving by his third marriage a daughter, named Blanche, who married Philippe, Duke of Orleans, and died (1392) leaving no issue. Isabelle (daughter of Philippe le Bel) married Edward II. of England, and was mother of Edward III., who consequently took the title of king of France, which was retained by the kings of England until the reign of George III.; but Philippe of Valois, cousin of the last Capetian king, and grandson of Philippe III., *le Hardi*, claimed the crown of France by virtue of the Salic Law, and so founded the dynasty of Valois (q.v.).

CAPE TITMOUSE, *tít'mows* (*Parus Capensis*): small bird of the order *Incessores* and family *Paridae*; its home is the Cape of Good Hope, Africa. It builds its nest in the shape of a narrow-necked jar or bottle, with a pouch outside, in which the male rests and keeps watch while his mate is hatching within. When she emerges and he follows, he closes the mouth or door of the nest by beating it violently with his wing. These displays of intelligence have attracted to the bird much attention.

CAPE TOWN: capital of Cape Colony, faces Table Bay to the n.e., is flanked by the mountain Lion's Head, with its continuation of Lion's Rump or Signal Hill, and has behind it the precipices of Table Mountain; lat. is 33° 56' s., long. 18° 28' 7" e. Its mean temperature is 58·3° F. for winter, 76·6° for summer, and 67·3° for the year. It is connected by railway with a widening area; by telegraph with the diamond fields and the Orange Free State, as also by Natal and Aden with Europe; and by a weekly mail service with England. It is the chief port for the coasting trade and for foreign exports and imports; is well supplied with fish, meat, dairy produce, and every sort of fruit and vegetables, at a moderate price. It has a supply of fresh water of excellent quality. C. T. is the seat of the government, the supreme court, and a college and university. All the churches are well represented—the English Epis.,

CAPE VERD—CAPE VERD ISLANDS.

the Rom. Cath. and the Presb., Luth., Wesleyan, Congl., a free church (chiefly an off-break from the Dutch Church), a Jewish synagogue, and a Mohammedan mosque for the Malay population. There are banks and insurance offices. The town is built upon a double slope, which subsides into a plain on the n.e. side. Its streets, at right angles to each other, are lined with houses, for the most part of an eastern type, with heavy walls, flat roofs, and large public apartments, interspersed with increasing numbers of shops and warehouses of the English style.

The most remarkable structures are the breakwater, with the docks and patent slip; the castle, with its outworks and bastions; the barracks for the military; the Rom. Cath. cathedral, with a few other places of worship; the museum and library, with the botanic gardens in front; and between it and Government House, a park, with its avenues shaded by stately oaks. Out of town, a little distance to the n.w. is Somerset hospital, and the royal observatory about two and a half m. to the northeast.

C. T. returns four members to the colonial assembly. The municipality is administered by a town-council of 18 members—three from each of six separate districts—and is presided over by a mayor elected annually by the council. The port of C. T. possesses about 50 vessels, with a united tonnage of about 5,000 tons. During the Boer War of 1899-1901 it was an important base of military supplies for the British, and also a port for the landing of troops. Pop. 83,898.

CAPE VERD, *verd*: most westerly headland in Africa, jutting into the Atlantic ocean, between the rivers Gambia and Senegal, lat. $14^{\circ} 43'$ n., long. $17^{\circ} 34'$ w. It was discovered by the Portuguese about 1445, and is said to have derived its name from a group of gigantic baobab-trees which adorns its summit.

CAPE VERD ISLANDS (*Ilhas Verdes*): group of islands belonging to Portugal, lat $14^{\circ} 45'$ — $17^{\circ} 19'$ n., long $22^{\circ} 45'$ — $25^{\circ} 25'$ w.; about 320 m. w. of the cape from which they take their name. The principal islands are ten—viz., Santiago (largest and most important), Fogo, Brava, Maio, Boavista, San Nicolão, San Antonio, San Vicente, San Luzia, and Sal. There are besides four islets, barren and uninhabited; total area about 1,700 sq. m. The islands are all very mountainous, and owe their origin to the action of submarine volcanoes. The highest elevation is a volcanic peak, 9,157 ft. above the sea, on the island of Fogo, and which is still active. The climate is unhealthful during the rainy season. Though water is deficient, vegetation is luxuriant, yielding African and s. European products. Sugar, cotton, coffee, tobacco, and indigo are grown, and the trade in archil, monopolized by government, has in some seasons yielded as much as \$120,000. Several of the European domestic animals thrive well. Turtles are abundant in the surrounding seas, and whales also are fished by British and American vessels. Amber is found on the coasts, and much salt formed by solar

CAPE WRATH—CAPILLARIES.

evaporation is obtained from the lagunes on the shores, especially on the island of Sal. The inhabitants, mostly negroes, indolent but harmless, speak a corrupted form of Portuguese, called *Lingua Creoula*. The revenue for 1882-3 was estimated at about \$260,000, and the expenditure for the same year at \$225,000. The islands are under a gov. gen., exercising both civil and military authority. In 1898 Admiral Cervera stopped here before sailing against the American fleet. Shortly after it was reported that another Spanish squadron visited the islands, but later was ordered to the Philippines. It, however, sailed only as far as the Suez Canal, when it returned to Spain. Pop. (1900) 147,424.

CAPE WRATH: pyramidal promontory of unrivalled wildness and grandeur, the n.w. extremity of Scotland and of Sutherland, and running out into the Atlantic; lat 58° 38' n., long. 4° 58' 5" w. It consists of gneiss, with beds of dark hornblende rock, is intersected by complex granite veins, and presents deep fissures and tall pinnacles. From it a reef of rocks, perforated with arches and caverns, juts out into the sea. Off the cape is stag rock, a pillar 200 ft. high. C. W. is 600 ft. high, and there is a lighthouse near it, 400 ft. above the sea, visible 25 m. off. From the cape can be seen N. Roma, 50 m. off; Hoy Head, Orkney; the Butt of Lewis; and a grand panorama of mountains in Sutherland.

CAPIAS, n. *kā'-pī-ās* [L., take or seize hold of]: in the practice of the common law, a writ of arrest before, or execution after, judgment: it is directed against the person, and has various applications, the principal of which are the following:

CAPIAS AD RESPONDENDUM, is a writ which a plaintiff, after action, may sue out upon affidavit against a defendant who, there is reason to believe, is about to quit the country. The writ directs the sheriff to arrest the defendant; but this arrest is only when the defendant's absence will prejudice plaintiff.

CAPIAS AD SATISFACIENDUM, or **CA. SA.**, is one of the writs by which a plaintiff can put in execution a judgment recovered by him. The object of it is to imprison the debtor till satisfaction. See on Capias generally, **APPREHEND: ARREST: ATTACHMENT: EXECUTION: BAIL.**

CAPILLAIRE, n. *kāp-ī-lär'* [F.]: medicinal syrup, used as a pectoral in chronic catarrhs; prepared by adding sugar and orange-flower water to an infusion of the fern called **MAIDENHAIR** (q.v.), or by pouring boiling sirup on the fern.

CAPILLARIES: extremely fine sub-divisions of the blood-vessels. The tubes which convey the blood from the left side of the heart to the various parts of the body are termed arteries, while those which return it to the right side of the heart, after it has discharged its various functions in the body, are known as veins; and the capillaries are the minute blood-vessels which form the connection between the terminal branches of the arteries

CAPILLARIES.

and the commencements of the trunks of the veins. These little vessels are of various sizes, some admitting only



Capillaries.

a, the artery; *b*, the vein;
c, the intervening capillaries.

one blood-corpuscle at a time, while others are large enough to allow the simultaneous passage of two, three, or more corpuscles. In the muscular tissue their average diameter is 0.003 of a line; they are smallest in the brain, and largest in bone. Their arrangement varies in different parts. In the accompanying figure, which represents their distribution in muscular tissue, they run for the most part parallel to one another; in other cases (as around fat-cells) they have a spherical arrangement, and in the skin and in part of the intestines they form loops; and there are many other forms of distribution. These various arrangements have been discovered by the microscopic examination of tissues that have been injected with colored fluids. The circulation of the blood through the *C*. may be readily seen in the web between the toes of the hind foot of the frog, in the tongue of that animal, in the tail or gills of the tadpole, in the wing of the bat, etc. For the principal uses of the capillary system of vessels, see **DIGESTION: NUTRITION: RESPIRATION: SECRETION.**



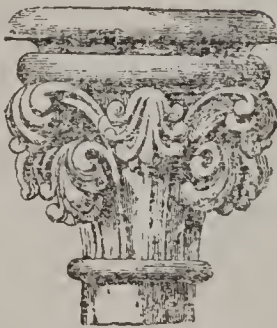
Caoutchouc (*Siphonia elastica*)



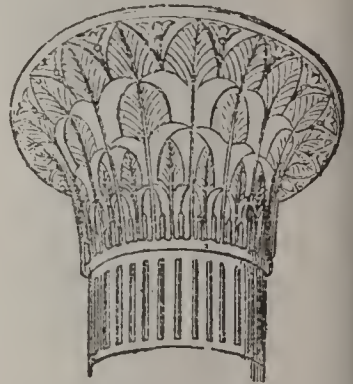
War-horse caparisoned, from seal of Philip of Burgundy.



Capelan.



1, Moorish Capital, Alhambra; 2, Gothic Capital, Salisbury Cathedral.



Egyptian Capital.



Capsicum annuum.



Capsicum annuum. Another specimen.

CAPILLARY—CAPILLARY ACTION.

CAPILLARY, a. *kăp'îl-lér-î* [F. *capillaire*, capillary—from L. *capillāris*, pertaining to hair—from *capî'lus*, hair—from *caput*, the head]: resembling hair; tubes or canals, extremely fine and minute, through which fluids ascend spontaneously, are called *capillary tubes*. **CAPILLARY ATTRACTION**, the force which causes fluids to ascend in fine tubes, or generally into porous substances (see **CAPILLARY ACTION**). **CAP'ILLARIES**, n. plu. *-lér-îz*, in *anat.*, the extremely fine subdivisions of the arteries, etc. **CAP'ILLAR'ITY**, n. *-lăr'î-tî*, the state or condition of. **CAP'ILLA'CEOUS**, a. *-lă'shūs*, very slender, like hair. **CAPILLAMENT**, n. *kă-pîl'-lă-měnt*, a fine fibre or filament. **CAPIL'LIFORM**, a. *-lî-fawrm* [L. *forma*, shape]: hair-shaped.

CAP'ILLARY AC'TION: the effect of small tubes in attracting fluids into, or repelling them from, their orifices. When a clean glass tube with a fine bore, open at both ends, is plunged into a liquid capable of wetting it, such as water, the liquid is found, (1) to rise in the tube above the level of its surface in the vessel containing it; (2) to rise the higher in the tube above that level, the finer its bore is; (3) to stand above the general level in the tube where it approaches the sides (as in fig. 1, which is drawn on a greatly exaggerated scale), so that its upper surface in the tube is curved and concave. When a similar tube is plunged into a liquid incapable of wetting it, such as mercury, phenomena precisely opposite are presented. The liquid stands in the tube below the level of its surface

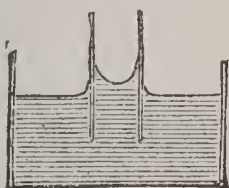


Fig 1.

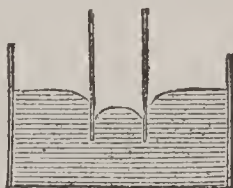


Fig. 2.

in the vessel; and where it approaches the sides of the tube it stands below its general level in the tube, so that its upper surface is curved and convex, as in fig. 2, the convexity and depression in the tube increasing with the fineness of its bore. While such is the case with the two classes of liquids described, there are other classes on which fine tubes have no action, so that they stand in such tubes at the same level as in the vessel, and with plane upper surfaces. These are the leading phenomena of C. A., the

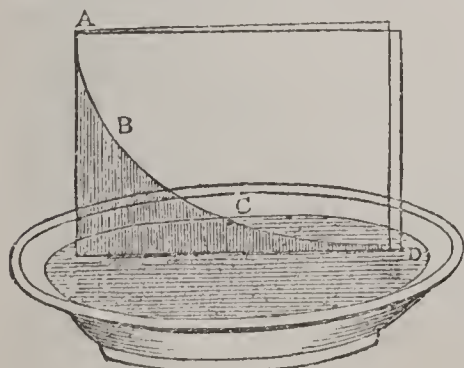


Fig. 3.

tubes with fine hair-like bores being called capillary tubes. The phenomena, however, are not dependent on tubes, but may be produced by any contrivance which gives room for similar action. For instance, if two plates of glass with parallel faces be placed together with two of their edges in contact, and the two opposite be separated a very little by

a fine wedge; and then if they be put standing with their

CAPILLARY ACTION.

common edge vertical in a trough (fig. 3), containing a little colored fluid capable of wetting the glass, the fluid will rise between the plates, the height attained at any point being inversely as the distance between the plates at that point, so that its upper surface will be a curve of the kind known as the hyperbola—being highest near the common edge, and lowest near the edges separated by the wedge. If the same apparatus be placed in a trough containing mercury, the mercury will be depressed between the plates till its upper surface forms a hyperbola convex to the zenith.

To understand the peculiar action producing these phenomena, it must be kept in view that the surface of a fluid at rest under gravity is a horizontal plane (see HYDROSTATICS), and that this plane is maintained by gravity and the mutual attractions of the particles of the fluid mass. Suppose now a fluid at rest in a vessel to have a foreign body, such as a capillary tube, suddenly plunged into it, and separating, as by walls, a portion of the fluid from the

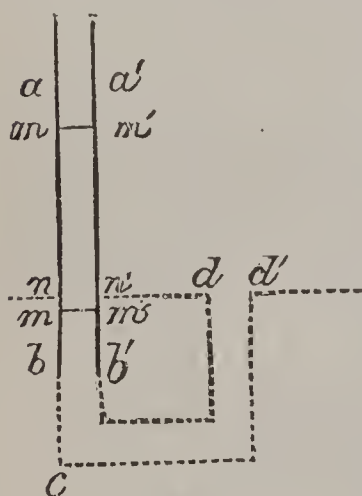


Fig. 4.

rest. By cohesion (q.v.), the fluid particles caught inside the tube will be held on—drawn downward—to the mass of the fluid, while by adhesion (q.v.) they will be drawn upward toward the sides of the tube. By the ordinary action of gravity, as in tubes of a large size, the fluid will at once tend to rise in the tube to its level in the vessel. Whether it will succeed in doing so, or whether it will rise still higher, must depend on the adjustment of the forces of cohesion between the fluid particles and their adhesion to the solid of the tube. The relation of these forces may be generally explained as follows: Let mm' (fig. 4) be the surface of the column, mn , of a liquid contained in a space, $abb'a'$, above or below the surface, nn' , of the external liquid. There being equilibrium between the liquid in the tube and in the vessel, any line of liquid particles may be taken and supposed to be detached from the rest and inclosed in a tube, without altering the forces exerted. Let the line included between the dotted lines be conceived so detached. The actions which the particles of the liquid in the tube exert on each other, or sustain from the sides of the tube, have no tendency to make the liquid move either up or down. But the column, mb , in the tube has some action exerted on it by the sides of the tube above the surface, mm' . Let A , depending on the force of adhesion, represent this upward action of the tube. The column is also attracted downward by the detached column, bc , i. e., by the liquid in the imaginary tube. Let C , depending on the force of cohesion, represent this downward action of the liquid. Also the part bc of the liquid is attracted upward by the tube ab by the attraction which we have represented by A . Thus the

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liquid column is acted on by two upward actions $= 2A$, and a downward action, C . The whole force acting on it, excluding gravity, is $2A - C$. Gravity would make the liquid rise to nn' at once, i. e., till it stood as high in the tube as in the vessel. Whether, then, it will rise above nn' , or be depressed below it, must depend on whether $2A$ is greater than C , equal to it, or less than it. If $2A = C$, the liquid will stand in the tube at the level nn' , as if these forces did not act at all. If $2A > C$, then $2A - C$ will be an upward force, and the column will be raised above the level nn' . If $2A < C$, then $2A - C$ will be a downward force, and the column be depressed.

Regarding the forms of the upper surfaces of columns of liquid in capillary tubes, it can be demonstrated mathematically that the same relations of the forces of attraction and cohesion which determine the elevation or depression of the liquid column determine also the form of its upper surface in the two cases of elevation and depression. In fact, the case of the elevated column resembles that of a cylinder of any very elastic substance (so elastic as to suffer change of form very readily under pressure), supported wholly by *the rim* at one of its ends; or, what is the same thing, by vertical forces acting in the lines composing its outer surface. Gravity draws down the concentric shells, of which the cylinder may be conceived to be composed, the further the more remote they are from the outermost, or that which is directly supported, the central rod being the most depressed. It appears that the form of the surface has an important bearing on the cause of the production of the whole phenomena.

The third fact of observation—viz., that the liquid rises higher or is more depressed the finer the bore of the tube—is thus explained in the case of elevation: Since the action of adhesion is confined to the superficial layer of the fluid, and between the same substances is, *ceteris paribus*, constant in quantity for an equal extent of surface, the wider the tube the shorter must be the column sustained, as the contents of the column raised by cohesion increase more rapidly when the bore increases than the attracting surface. The column increases with the square of the diameter of the tube, while the attracting surface increases only with the diameter. The height, therefore, is inversely as the breadth of the tube. That the depression must increase as the bore of the tube diminishes, appears from reasoning similar to that employed in the case just discussed.

The degree of elevation varies with the nature of the fluid, the variation depending partly on the difference of cohesion between the particles of the fluid, and partly on the difference of adhesion between the fluid and glass. It is found that temperature affects these forces, so that the height diminishes as the temperature rises.

The depression of mercury in a fine glass tube makes it necessary to use a correction in reading off the height of the mercurial column in the barometer, which, owing to it, stands always a little lower than the height due to the

CAPILLARY ACTION.

atmospheric pressure. Experience, however, has shown that the capillary depression is nearly one half less in tubes which have had the mercury boiled within them than in unboiled tubes, as by the boiling a film of air, which in unboiled tubes adheres to the glass, is expelled. By widening the bore of the tube also, the error may be diminished so as to be neglected altogether. In a tube of $\frac{1}{4}$ inch in diameter, in which the mercury has been boiled, the depression is 0.02 inch, while with a similar tube of $\frac{1}{2}$ inch diameter it is only 0.003. The depression of mercury, it is found, is slightly increased by an elevation of temperature. It may be mentioned that in reading off the level of mercury in any instrument, such as the barometer, the height should be taken from the convexity of the curve. If the liquid used in the instrument, however, wets the tube, the height should be taken from the concavity.

As already stated, the phenomena are not dependent on the intervention of tubes; any capillary cavity suffices to produce them. When two light bodies, such as two bits of cork, are left to float on water, near each other, they soon come together, moving at last with a rush. This is sometimes given as an example of the gravitation that draws the planets to the sun; but it is really owing to this capillary action that we are considering. When the liquid wets the floating bodies, it rises slightly all round them, and this sustained liquid hangs as a weight on them on all sides. So long as it rises equally, there is no motion; but when the bodies come near each other, the space between them becomes like part of the inside of a capillary tube, the water rises higher there than on the other sides, and the bodies move toward the sides that are most strongly pulled. When the floating bodies are not wetted by the liquid the surface between the two bodies is depressed, as that of mercury is inside a glass tube, and the bodies descend, as it were, down the opposing slopes, and meet in the bottom of the hollow. If one of two bodies floating on water is smeared with oil, so as to prevent the water from adhering, instead of coming together the two will recede from each other, for reasons analogous to the above.

C. A. acts a most important part in nature in a great variety of ways. An instance of its employment by man is seen in the wicks of lamps and candles, which, being composed of fibrous materials, furnish many hair-like channels by which the melted oil is elevated to the flame, and supplied as fast as it is consumed. C. A. influences the circulation of fluids in the porous tissues of animals, and it is the principal mode in which water, with the various substances which it holds in solution is supplied to the roots of growing plants. It is through it that in summer droughts moisture is raised to the surface for the maintenance of vegetable life. C. A., too, affects many phenomena usually considered under the head DIFFUSION (q.v.) of fluids and gases. For its relation to the phenomena known as exosmosis and endosmosis, see OSMOTIC ACTION.

A familiar illustration of C. A. is furnished when one

end of a towel happens to be left in a basin of water while the other hangs over the side below the level of the water; the basin is soon emptied of its contents. It is important to observe that, although the towel will become wet, not a drop will flow from it, unless the outside end reach below the level of the water in the basin. In this respect C. A. resembles the action of the siphon. And this shows the error of supposing that water may rise through the earth by C. A., and flow out as springs at a higher level than the source whence it is drawn.

Some very interesting experiments have been made by M. Poissenille (*Ann. de Chimie et de Phys.* III. xxi. 76) concerning the flow of liquids through capillary tubes, from which it appears that when the tube exceeds a certain length—which is greater as the bore increases—the following laws regulate the rate of efflux of the liquid, the efflux taking place under pressure: 1. The flow increases directly as the pressure, so that under double the pressure, double the amount is discharged in equal times. 2. In tubes of equal diameter the quantities discharged vary inversely as the length of the tube. If a tube 2 inches long discharge 100 grains in 5 minutes, a tube 4 inches long will discharge only 50 grains. 3. In tubes of equal lengths, but different diameters, the flow is as the fourth power of the diameters. If one be $\frac{1}{50}$ of an inch in bore, and the other $\frac{1}{100}$, the efflux from the larger will be 16 times as great as from the smaller. It is further found that the efflux varies with the nature of the liquid, the material of the tube not appearing to affect the result in any great degree. No law of the rate of efflux has yet been discovered, depending on the density, capillarity, or fluidity of the fluids.

Tubes to be used in the experiments on capillarity should be perfectly clean and dry. If wetted, the film of moisture on the tube forms a new tube, and the action will be the same as with a tube of the substance forming the film. See Miller's *Elements of Chemistry*, and J. Clerk Maxwell's *Theory of Heat*, where the phenomena are treated from a different point of view; the phrases 'superficial energy' and 'superficial tension' being substituted for 'capillarity,' and the hypothesis of molecular attraction being avoided.

CAPITA, DISTRIBUTION PER: i.e., distribution by heads, or by numbers, equally; occurring in the case of several claimants to the property of a deceased person, all severally claiming in their own right, in equal degree of kindred, and not under any right of representation: see INHERITANCE: SUCCESSION.

CAPITAL, a. *kăp'î-tăl* [F. *capital*, capital, chief—from L. *capitālis*, that by which life is endangered, pre-eminent—from *caput*, the head: It. *capitale*]: chief; principal; first in importance; punishable by loss of life; great; large of size: N. the ornamental part of a column, pillar, or pilaster, placed at the top immediately over the shaft, but under the entablature (till the period of the Renaissance, the head of a column was, in Eng., called chapter [chapter], its diminutive being chapitrelle: see COLUMN); a chief city or town of a country or province, the seat of the government; a large letter or type; a stock-in-trade, consisting of money or goods; the debt or sum lent as distinguished from the interest. **CAP'ITALLY**, ad. *-lî*, in the highest degree; with loss of life. **CAP'ITALIST**, n. *-îst*, one possessed of large means engaged in, or able to engage in, extensive business undertakings. **CAP'ITALIZE**, v. *-îz*, to convert into capital, as money or stock. **CAP'ITALIZ'ING**, imp. **CAP'ITALIZED**, pp. *-îzd*. **CAP'ITALIZA'TION**, n. *-î-ză'shŭn*, act by which anything is converted into capital. **POLITICAL CAPITAL**, some national loss or disaster, some errors of opponents, or the like, by sagacious use of which a political party in the state may strengthen its position and chances of power. **CAPITAL FELONIES**, crimes for which a criminal may be hanged—formerly many, but now only a very few, and those of a desperate character (see FELON) — **SYN.** of 'capital, a.': principal; chief; leading; controlling; prominent.

CAPITAL, in Fortification: imaginary line dividing a defense-work into two similar and equal parts. The C. of a bastion is a right line drawn from the point or salient angle to the middle of the gorge or entrance in the rear. The C. of a ravelin is a right line drawn from the re-entering angle of the counterscarp to the salient angle of the ravelin. See the wood-cut in **CAPONIERE**.

CAPITAL, in Trade and Political Economy: in its restricted sense, applied to the money or the property convertible into money, with which a trader or producer carries on his business. In this sense Adam Smith and many other writers call it stock; and there is a convenience in having a separate term for expressing this sense of the word C., since it is totally different from its wider sense as an element in political economy. Many attempts have been made to define C. in its general sense, but with imperfect success, since no sooner is a restrictive definition laid down, than some one can point at things which are C., yet not included in the definition. It has, for instance, been called the produce of past labor stored up and applied to the facilitating of future labor; but, as we shall see, many things become C. which the hand of man has never touched. There is no doubt, however, that the existence of C. arises out of the fact of labor or industry having been exercised; and perhaps a good general understanding of its character may be derived from treating it as the *impulse* or *impetus* which past industry gives to facilitate future industry. Wherever something is re-

CAPITAL.

served from immediate consumption, and made to serve in future production, there is capital. A good illustration is in the first bow and arrow made by the savage. He has expended on this machine for securing his food a portion of the time and labor which he might have given to the tedious task of catching his food with his own hands, and at this sacrifice he has obtained the means of more easily and economically obtaining it in future. All C. is not, however, *directly* made by the industry of the owner, or, indeed, by industry at all. The accidental finder of a diamond, or a pearl, worth £100, possesses so much capital. His acquisition, however, would have no value but for those productions of industry which it is permitted to represent, and if pearls and diamonds were often found they would cease to be valuable; the trade of finding them is as laborious and as ill remunerated in the long-run as most others. The owner of a barren heath, intrinsically worth nothing, finds it become suddenly valuable by the progress of a large town; but it is the industry, or at least the prosperity, of that town which has given the value, and the owner, having the good fortune to have a hold on a portion of the produce of that industry, becomes a capitalist. It is impossible to enumerate all the elements of which C. in the general sense consists, or all the ways in which it can be made. Whatever thing done or possessed enables some other thing to be done or procured which supplies any of the necessities or wishes of the human race becomes capital. Thus, the education and skill of the barrister, the physician, and the artist—the agility, acquired through long and toilsome practice, of the rope-dancer and the juggler—all are capital. It makes C. to shift the place of a thing, bringing it from where it is not, to where it *is*, wanted. So, also, the changing of a person's place may become C. to him, as where he leaves a district in which his trade is not required, or exceeds the demand, for one where he can pursue it to advantage. Successful emigration thus creates C., bringing into human use districts of land previously useless. The total C. at any time in existence consists of an aggregate of the several capitals at the command of individuals or communities. But it is essential to any unit of C. that it should be sufficient for the purpose it is intended for, otherwise it may seem to be, but will not in reality be, a part of the general aggregate—it will, in fact, be lost. If an expenditure of \$5,000 be necessary to raise a sunken ship, and only \$4,500 are expended, that sum, which might have been available for some other purpose, is lost. C., as distinguished from property or wealth, is a *moving force*; and if it be not sufficiently strong for accomplishing its purpose, it is lost. This is one of the most important truths in all political economy, since most of the great losses suffered by communities and individuals arise from undertakings for which they have not adequate C., or for which that which seems to be C. does not really turn out to be so. Perhaps the most memorable mistake of this kind ever made was when the French revolutionary

government issued assignats (q.v.). These were issued ostensibly on a good security—namely, the security of the forfeited land. But however valuable that land might be in the long-run, it was not available to pay the assignats; there was no purchaser for it; and the assignats consequently fell in value. Gold to a far less amount than the money value of the land—that is to say, than the price which would be paid for it when sold in the natural course of things—would have been a sufficient C. for the issue of these assignats. The same mistake is often made on a small scale when a landed proprietor keeps together a large estate which he cannot afford to improve and cultivate properly. It loses its power of C. in his hands; and he would be in much better condition if he sold a portion of it for money to be invested in improvements on the remainder. Probably 19 out of every 20 bankruptcies arise from the bankrupts having undertaken enterprises beyond the reach of their C.—from over-trading, or over-speculating as it is otherwise called. When speculation becomes epidemic, the whole community suffers from undertakings too great for its C., and a crisis occurs. Such was the great railway crisis of 1847 in Great Britain. Parliament had, in the previous year, passed bills for the construction of railways, which, if they had all been made, would have cost upward of £130,000,000—a sum which the country, rich as it was, could not afford to advance. Though it is an axiom that people cannot trade beyond their C., yet what can be accomplished by any given amount of C. must depend on the skill and sagacity of the person employing it. Competition no doubt tends to equalize profits, but competition is itself a contest in which each tries to drive a more profitable trade than his neighbors, and some are more successful than others. A frequent element of success is the rapid circulation of C., by which it is made to return repeated profits, though perhaps small ones, in the course of the year. The trader who turns over his C. ten times at a profit of 3 per cent., makes more than he who draws a single profit of 10.

CAPITAL PUNISHMENT.

CAPITAL PUNISHMENT, in Criminal Jurisprudence the punishment of death. It is called *capital* punishment because the head (L. *caput*), is usually that part of the body which is acted on, as especially in beheading and hanging. This extreme penalty, notwithstanding the practice of the world from the remotest times down to the present day, has frequently been reprobated by philosophers and philanthropists, who have even gone so far as to deny to any earthly power the right so to punish. The weight of authority, however, appears in favor of capital punishment. Bentham, one of the most reasonable and discriminating authorities on the subject, in his well-known and valuable treatise, says, that the idea of C. P. would naturally suggest itself in the infancy of a state. When any one had committed an offense, and disturbed the peace of society, the question would then first arise: 'How shall we prevent these things?' and the answer most likely to occur to a set of barbarians would be: 'Extirpate the offender, and give yourself no further trouble about him.' And in conformity with this view of the matter, he alludes in a note to the case of the Hottentots, who have no fixed laws to direct them in the distribution of justice, and consequently, when an offense has been committed, there is no form of trial, or proportion of punishments to offenses; but the kraal (village) is called together, the delinquent is placed in the midst, and without further ceremony, demolished with their clubs, the chief striking the first blow. The Marquis Beccaria, in his remarkable *Essay on Crimes and Punishments*, strongly argues against the capital sentence being carried out in any case, denying the right, in fact, of government so to punish, and maintaining, besides, that it is a less efficacious method of deterring others, than the continued example of a living culprit condemned, by laboring as a slave, to repair the injury he has done to society. Bentham, on the contrary, holds that death is regarded by most men as the greatest of all evils; and that especially among those who are attached to life by the ties of reputation, affection, enjoyment, hope, or fear, it appears to be a more efficacious punishment than any other. On the question of right, Beccaria is still more pointedly refuted by Sir Samuel Romilly, who observed: 'Beccaria and his disciples confess that it is not the greatest of evils, and recommend other punishments as being more severe and effectual, forgetting, undoubtedly, that if human tribunals have a right to inflict a severer punishment than death, they must have a right to inflict death itself' (*Memoirs*, vol. iii. p. 278). It is interesting to know, that such was the opinion of one who did so much as a statesman to mitigate the severity of the criminal law.

Against C. P. arguments are often urged from Scripture, based on the general principle of Christian charity, as set forth in the New Testament. To these it is replied that they proceed on a misapprehension and misapplication of the principle; and reference is confidently made to the Old Testament as sufficiently exhibiting the mind of the great Lawgiver in regard to this matter. The experiment

CAPITAL PUNISHMENT.

of abolishing C. P. has been tried in Wisconsin and Maine since 1874, and in Iowa since about that time; but it seems not yet to have resulted in a settled opinion on the question. In Iowa the death-penalty was re-established after about four years, owing to the alarming increase of violent crimes; it is required, however, that at least a year shall intervene between the sentence and its execution. In the other states C. P. retains its legal place, and seems likely to do so. C. P. was abolished in Switzerland, Holland, Portugal and Roumania; but when, 1881, the power was conferred on the several Swiss cantons of deciding whether to restore the death-penalty or not, some of them immediately availed themselves of the permission to restore it.

Death was, in former times in England, the ordinary punishment for all felonies, and the certain doom of those who could not avail themselves of *benefit of clergy* (q.v.), i.e., the common law inflicted death on every felon *who could not read*, and the law implied that punishment, where a statute made any new offense felony. On the other hand, the numerous acts of parliament creating felonies without benefit of clergy, show that the statute law was still more sanguinary, so that of the 160 offenses referred to by Blackstone as punishable with death four-fifths had been made so during the reigns of the first three Georges. That some idea may be formed of such Draconian justice as was then established, the following may be mentioned as among the offenses which involved sentence of death—stealing in a dwelling-house to the amount of 40s.; stealing privately in a shop goods of the value of 5s.; counterfeiting the stamps that were used for the sale of *perfumery!* and the stamps used for the certificates for *hair-powder!* Thanks, however, to the exertions of Sir Samuel Romilly, such inhumanity and impolicy of the criminal code gave way, toward the end of the reign of George III., to a course of legislation which has reduced the application of death, so that practically it is only in the case of treason and murder that the capital sentence is ever pronounced; and even then it is not always executed, for the crown reserves to itself and exercises a right of review which frequently leads to such a change in the convict's fate as at least spares his life. This discretionary control on the part of the executive is essential in the present state of the law, which affords no means for a judicial appeal on the merits; for the very nature of the punishment, when finally executed, precludes the idea of all benefit to the sufferer should the verdict of the jury afterward turn out erroneous, and the innocence, instead of the guilt, of the accused be established. The law as it stands, indeed, allows capital sentence to be reversed if technical error can be shown on the face of the judgment or other matter of record—but what avails that, after the sentence has been executed?

In Scotland, the administration of the criminal law has perhaps been, on the whole, as severe as in England. Mr. Erskine says, that 'those crimes that are in their consequences *most hurtful to society* are punished capitally or by death,' a category that is certainly sufficiently indefinite;

CAPITALS.

and anciently, it might be shown that the executions in Scotland for offenses corresponding to those capitally punished in England, were, in proportion to the population, quite as numerous as those in the latter country. But in the more modern practice of Scotland, capital sentence was pronounced only in the four pleas of the crown—viz., murder, rape, robbery, and wilful fire-raising, to which may be added housebreaking. At present the penal system in Scotland may be said to be identical with that in England.

Under the laws of the United States, the death penalty *may* be inflicted for the following crimes: treason, murder, arson (of a dwelling), rape, piracy, robbery of mails if endangering the lives of persons in charge, rescue of a convict on the way to suffer the death-penalty, burning a United States war-vessel, and corruptly destroying a private vessel. These crimes are such as involve, or tend to involve, the taking of human life. The actual execution of the death-sentence however is not frequent. The great war of secession, though many of its leaders had taken oath as officials to support and defend the constitution of the United States, was followed by no infliction of death for treason.

With respect to the mode of executing C. P., the cruelties and tortures of former times are well known. The methods now mostly practiced are *electrocution* (N. Y. and O.) *hanging and beheading*. In Spain, the death of the culprit is instantaneously caused by the *Garrote* (q.v.). In England, Scotland, and Ireland, and in all the dependencies of the crown, the convict is hanged; in France he is decapitated by the *Guillotine* (q.v.), an instrument which the old Scotch *Maiden* (q.v.) very much resembled. In Germany, beheading is the mode of execution adopted; but in Austria, hanging. For the mode in the United States, see EXECUTION OF THE DEATH PENALTY. See EXECUTION. For C. P. in the U. S. Army, see the law passed by congress, containing the articles of war, 1806, Apr. 10: for C. P. in the U. S. Navy, see the similar act, passed 1864.

See Basil Montagu *On the Punishment of Death* (1813); *Memoirs of Sir Samuel Romilly* (1840), and his writings; Bentham, *Rationale of Punishment* (1830); Beccaria, *Essay on Crimes and Punishments* (1775); Berner *Die Abschaffung des Todesstrafe* (1861); Mittermaier, *Die Todesstrafe* (1862; Eng. edition by J. M. Moir); Von Holtzendorff, *Das Verbrechen des Mordes und die Todesstrafe* (1874); Clode's *Administration of Justice under Military Law*.

CAPITALS (*majuscula*): in distinction from small letters (*minuscula*): the large letters employed in writing and printing to help the eye, to relieve the uniformity of the page, to increase the facility of keeping and finding the place, to mark the beginnings of sentences, proper names, etc.—Among the ancients, and during the earlier middle ages, no distinction of C. and small letters was known; and after the practice had been introduced of beginning books and chapters with great letters often adorned or illustrated with much artistic ability, it was long before C. were employed

CAPITANATA—CAPITOL.

in such a way as could afford much real advantage to the reader. At the present day, they are universally employed, even in the printing of Greek and Latin books. There has been, and still is, considerable diversity with regard to the occasions for their use, the books of the 17th and 18th c. exhibiting a much greater proportion of them than those of the present day, though in recent years there is in England and America a tendency to revert to a more frequent use of C. In German books, all substantives usually begin with a capital letter; in English and French books of the present day, they in general appear only at the beginnings of sentences and of proper names. Adjectives formed from proper names, as *English*, *French*, etc., are generally begun with a capital in English books, but not in French nor in German ones.

CAPITANATA, *kâ-pe-tâ-nâ'tâ*, or **FOGGIA**, *föd'já*: province of Italy, the *Daunia* of the ancients; bounded n. and e. by the Adriatic, and on the s.w. by the Apennines. It stretches along the Adriatic about 70 m. in a straight line, and its average breadth is about 45 m.; but its coast line, measuring round the great promontory of Monte Gargano, 'the spur of Italy,' is fully 100 m., and its breadth between the extremity of that projection and the Apennines, 75 m. The greater part of the surface is a sandy plain sloping from the Apennines to the Adriatic, watered only by inconsiderable streams. The rearing and feeding of cattle form the chief occupations of the inhabitants. Wheat, wine, and fruits of various kinds are produced in quantities sufficient to admit of exportation. There are important salt-works, quarries of alabaster, and potters' clay. Foggia is the chief town. Pop. (1900) 425,450.

CAPITAN-PACHA, n. *kăp'î-tăn-pă-shâ'* [Sp. *capitan*, a captain—a word adopted by the Turks]: the chief admiral of the Turkish fleet. High admiral of Turkey, having entire command of the navy and management of all naval affairs. The port of Pera, the Turkish islands in the archipelago, and a number of seaports and maritime districts, are under him even in their civil administration.

CAPITATION, n. *kăp'î-tă'shŭn* [F. *capitation*, a poll-tax—from mid. L. *capitātiōnem*, a capitation-tax—from L. *capitātus*, having a head—from *caput*, the head]: a numbering of persons as if per head: so much per head or individual; a poll-tax. **CAPITATE**, a. *kăp'î-tăt*, in *bot.*, like a pin-head; having a rounded summit, as some hairs, and stigmas. **CAPITATION-GRANT**, a sum of money paid by government to each person fulfilling certain specified conditions. **CAPITATION-TAX**, a tax imposed on each person above a certain age without reference to property and similar incidents. The term was formerly used in France for the tax better known as the *taille*, though that offensive impost was not applied to all alike.

CAPITOL, n. *kăp'î-tŏl* [L. *capitolium*—from *caput*, the head]: the temple of Jupiter in Rome and a fortification where the senate of anc. Rome met; the hill on which that temple stood—the *Monſ Capitolinus*; the building in Wash-

CAPITOL—CAPITOLINE GAMES.

ington occupied by the congress of the United States (see WASHINGTON). CAPITOLIAN, a. *kăp'î-tō'li-ăn*, or CAPITOLINE, a. *kăp'î-tōl-în*, pertaining to the capitol (q.v.) of Rome, or the hill on which it stood.

CAP'ITOL, of ancient Rome: the fortress and site of the national sanctuary of the temple of Jupiter; on the *Mons Capitolinus*, the smallest but most famous of the seven hills on which Rome was built. The hill itself was first termed *Mons Saturninus*, afterward *Mons Tarpeius* and *Rupes Tarpeia*, and after the foundation of the capitol, *Mons Capitolinus*, though a particular portion of it retained its ancient name of *Rupes Tarpeia*. It was steep and abrupt in almost every part, a natural fortress, strengthened here and there by towers. The C. was founded by Tarquinius Priscus, and completed by Tarquinius Superbus, who tasked the people to work at it. The whole mount had a circumference of about 800 paces. During the civil wars under Sulla, the temple was burned (according to Tacitus, by design), and after its restoration, destroyed during the Vitellian riots. It was rebuilt by Vespasian, after whose death it was again destroyed by fire, but was once more restored by Domitian, who instituted here the Capitoline games. Domitian's structure lasted to a late period of the empire. Regarding the site of the C. there has been great dispute, the German scholars, for the most part, maintaining that it occupied the s.w. summit of the hill, and the Italians, the n.e. The latter situation has the weight of probabilities in its favor. From that portion of the mount named the Tarpeian Rock, state criminals were thrown down. According to the description given by Dionysius of Halicarnassus, the temple of Jupiter, with its peristyle of columns, was 200 ft. long by 185 ft. wide, and was divided into three cellæ, separated from each other by walls, and respectively dedicated to Jupiter, Juno, and Minerva. In the spacious portico, the people feasted on triumphal occasions. The scanty ruins remaining in the present day consist of a substructure of peperino or volcanic tufa, a wall of the same materials, and some remains of the s. front, together with a portion of the great flight of steps leading to the temple.

The modern C. (*Campidoglio*), built on the site, and partly on the foundation of the ancient C., was designed by Michael Angelo, but is one of his inferior works. The main entrance, however, presents a splendid view. It is used as a kind of hotel-de-ville and museum.

Besides the great temple of Jupiter, the most important structures on the Capitoline Mount were the temple of Jupiter Tonans, built by the Emperor Augustus; and the magnificent *Tabularium*, containing archives, and, in connection with the *Ærarium* ('Treasury'), serving as a library and place for lectures, etc. The remains of this structure, built by Quintus Catulus, B.C. 73, have still an imposing aspect.

CAPITOLINE GAMES, *kăp'î-tol-în gāmz* (*Ludi Capitolini*): instituted in Rome B.C. 387, at the suggestion of

CAPITULAR—CAPITULATION.

Camillus, in honor of Jupiter Capitolinus, and to commemorate the preservation of the capitol from the Gauls. These games were celebrated annually, and one of their features was the selling at auction of the *Sardiani*, supposed to mean Sardinians or Veiians. The C. G. fell into disuse, and were revived by Nero after the model of the Olympic games, as a quinquennial celebration. Nero attempted to bring in a new computation of time by them, as had been done by the Olympiads among the Greeks.

CAPITULAR, n. *kă-pīt'û-lér*, or **CAPITULARY**, n. *-lér-î*, [mid. L. *capit'ulārīs*—from L. *cāpitūlum*, a little head, the head or chapter of a pillar—from *cāput*, the head]: the laws of an ecclesiastical council or chapter; the member of a chapter: **ADJ.** relating to the chapter of a cathedral. **CAPIT'ULARLY**, ad. *-lî*. **CAPIT'ULARIES**, n. plu. *-lér-îz*, laws issued by the kings of the first and second of the Frankish races, from Charles Martel downward. These laws proceeded from the great assemblies of the king, nobles, and bishops, which formed the states of the kingdom, and, from their general character, were distinct from the laws issued for the separate states, which were called *leges*. They were divided into general and special capitularies, according to the more or less general nature of the interests which they embraced, and the mode of their publication. They have not all been preserved. The most famous are those of Charlemagne and of St. Louis. In 1827, Abbot Angenius, of Fontenelles, made a collection of the capitularies of Charlemagne, and of his son, Louis le Débonnaire. Other collections were made by private persons, and, 847, one by authority of the king, but they all are very imperfect and ill arranged. After Charles the Simple, 922, no more capitularies were issued, and no similar laws or statutes exist from that period till the time of Louis le Gros, 1100. The best collections are those of Baluze (Paris, 1677 and 1780) and of Pertz, in the *Monumenta Germaniæ*.

CAPITULATE, v. *kă-pīt'û-lāt* [mid. L. *capitulātus*, chaptered, proposed terms—from *capit'ulum*, a little head—from L. *cāput*, the head]: to surrender, as an army or garrison to an enemy, on certain conditions, or on an agreement under certain heads: **ADJ.** in *bot.*, furnished with a capitulum. **CAPIT'ULA'TION**, n. *-lā'shŭn*, the act of thus surrendering to an enemy; the written conditions or treaty. **CAPIT'ULATING**, imp. **CAPIT'ULATED**, pp. **CAPIT'ULA'TOR**, n. *-tér*, one who. **CAPIT'ULUM**, n. *-lŭm*, in *bot.*, a flower-head composed of a number of florets arranged without stems on the summit of a single peduncle; in *nat. hist.*, the body of a barnacle as being supported upon a stalk or peduncle.

CAPITULATION, *ka-pīt-û-lā'shŭn*: treaty consisting of several specified conditions. In the military sense of the word, a C. is a treaty of surrender to an enemy. When a place can no longer be defended, on account of failure of ammunition or provisions, or the progress made by the besieging-party, a white flag is commonly put up, as a sign

CAPIVI—CAPO D'ISTRIA.

that the besieged are willing to capitulate. According to the kind and degree of peril in which the fortress is placed, so are the terms which its governor may reasonably expect from his successful opponent. Sometimes the arms and military stores are left to the besieged, but more frequently they are taken by the besiegers, except articles of private property belonging to the officers and men. The 'honors of war,' the marching out with drums beating and colors flying, are usually stipulated for, unless the conqueror exacts very severe terms. The mildest form of a C. is a *convention*, agreed to when the conqueror is not strong enough to insist on stringent conditions.

CAPIVI, n. *kă-pě'vĩ*: see COPAIBA.

CAPIZ, *kă-pēs'*: town on the island of Panay, in the Philippine archipelago. It is on a plain on the n. coast, near the rivers, Panay, Panitan, and Ivisan, by which it is sometimes inundated during the rainy season. It is defended by a small fort, and is the residence of a Spanish alcalde. Pop. 11,000.

CAPLIN: see CAPELAN.

CAPNOMANCY, n. *kăp'nō-măn'sĩ* [Gr. *karnos*, smoke; *mantei'a*, divination]: divination by the motion or the appearance of smoke. The ancients practiced it in two different ways—either they threw grains of jasmine or poppy on the burning coals, and watched the motions and the density of the smoke that rose from them, or they watched the smoke of sacrifices. This latter kind of C. was most generally employed, and that to which the greatest importance was attached. If the smoke was thin, and ascended in a right line, instead of being blown black by the breeze, or spreading over the altar, the augury was good. It was also believed that the inhalation of the smoke rising from the victims or from the fire which consumed them, gifted the priests with prophetic inspiration.

CAPNOMOR, n. *kăp'nō-mōr* [Gr. *karnos*, smoke; *moira*, a part]: a colorless oil obtained from the oil of tar.

CAPOC, n. *ka-pōk'*: a kind of cotton, so short and fine that it cannot be spun; used in India to make mattresses, etc.

CAPOCH, or CAPOUCH, n. *kă-pōch'* [Sp. *capucho*—from *capa*, a cover]: a monk's hood; the hood of a cloak.

CAPO D'ISTRIA, *kă'pō dīs'trē-â*: fortified seaport town of Austria, on a rocky island in the Gulf of Trieste, 8 m. s.w. of the city of Trieste; cap. of the circle of Istria, with the peninsula of which it is connected by a stone causeway, nearly half a mile long. Its old buildings, ruinous walls, and narrow streets, give the town a gloomy aspect. It has a cathedral, manufactures of leather and soap, and a trade in wine, oil, and salt. In ancient times this place was known as *Ægida*, and afterward as *Justinopolis*, in honor of Justin II., who restored it. Pop. (1880) 8,646.

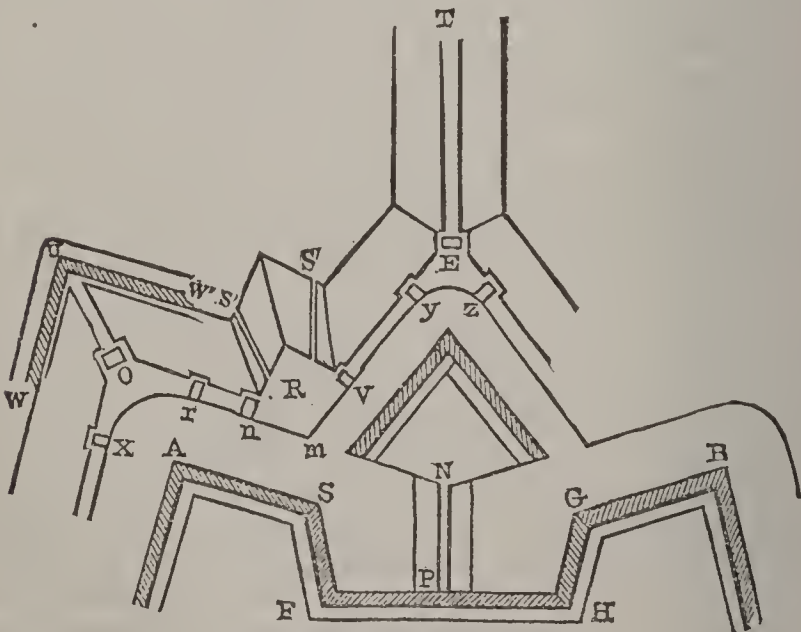
CAPO D'ISTRIA, or CAPO D'ISTRIAS, JOHN ANTHONY, Count: president of the Greek republic (1827–31): 1780–1831, Oct. 9; b. Corfu. His family had been settled

CAPON—CAPONIERE.

in that island since the 14th c., but originally came from the Illyrian town of Capo d'Istria (q.v.) near Trieste. He devoted himself to political life, and after having held high position in the Ionian Islands he entered the diplomatic service of Russia. Here his diplomacy tended to the separation of Greece from Turkey. In 1827, he was elected pres. of Greece; and 1828, Jan., he landed in Greece, and entered upon his office. He was a patriot, a philanthropist, and an able diplomatist, but not equal to the task which he now undertook. Everything was in disorder; the people, long enslaved, knew not how to use their freedom; and the president had been so much imbued with the centralizing principles prevalent at the courts which he had frequented, that some of his measures, especially that restricting the liberty of the press, gave offense to the most temperate of the enlightened lovers of civil liberty. His career was cut short by his assassination in a church at Nauplia. The assassins were relatives of Peter Mauro-michali, against whom he was urging on a prosecution, for alleged offenses against the state.

CAPON, n. *kā'pōn* [F. *chapon*, a capon—from L. *cā-pōnem*, a capon: A.S. *capun*; Sp. *capar*, to castrate]: a cock-chicken fed for the table; a castrated cock. CA'PONIZE, v. *-pōn-īz*, to castrate, as a fowl. CA'PONI'ZING, imp. CA'PONIZED, pp. *-īzd*.

CAPONIERE, n. *kāp'ō-nēr'*, or CAPONNIÈRE [F. *caponnière*. Sp. *caponera*, a coop]: in *fortification*, a parapet 8 or 10 ft. high, with a superior slope, terminating in a small glacis. It is placed in the ditch of a fortified place, to cover or screen the defenders while passing from one



Front of Fortification.

defense-work to another. Generally it has a banquette, on which musketeers may stand to fire over the crest. If there is a passage between two such parapets, it is a *full* caponnière; if on one side only, a *half* caponnière. Generally, the parapets are of earth, and the passage open overhead;

but sometimes caponnières are vaulted galleries of brick-work, loopholed at the sides for musketry, while in field-works, pallisade caponnières are occasionally thrown across the ditches of redoubts.

For a notice of the connecting-links between various defense-works, see FORTIFICATION. Annexed is a plan of what is called a *front* of fortification, illustrating many parts elsewhere described under their several titles. ASF is one half of a *bastion*; BGH, one half of another bastion; AS, BG are *faces* of the bastions; SF, GH are the *flanks*; A and B are *salient angles*; S and G are *shoulders*; F and H are *re-entering angles*; FH is the *curtain* between two bastions; PN is the caponnière, stretching across the main ditch from the curtain to the ravelin N; the white space on which the letters XAmSVyzGB stand is the *ditch*; ORE is the *covert* or *covered-way*; R is the *place of arms*; S', S' are *sally-ports* cut through the *glacis*; X, r, n, V, y, and z, are *traverses*; WUW' is a *flèche*, outside a salient angle of the *glacis*; OU is a second caponnière, leading to the *flèche*, with a traverse at O; E, T are a traverse and a caponnière leading to a redoubt supposed to be beyond the *glacis*; a line in the direction UA would describe the *capital* of one of the bastions.

CAPOT, n. *kă-pôt'* [F. *capot*, designating a play at cards, foolish: Ger. *caput*, ruined]: a winning of all the tricks of cards at the game of piquet: V. to win at piquet. CAPOT'-TING, imp. CAPOTTED, pp. *kă-pôt'éd*.

CAPOTE, n. *ka-pôt'* [F. Sp. *capote*—from L. *capa*, a cloak]: a long cloak or mantle reaching to the feet, worn by women; a coat with a hood, worn by soldiers, sailors, etc.

CAPOUCH, n. *kă-pôch'*: see CAPOCH.

CAPPADOCIA, *kăp-pa-dô'shê-a*: anciently a province, subsequently a kingdom, in the w. of Asia (in part the present Caramania). It was bounded by Lycaonia on the w., by Cilicia and Syria on the s., by Armenia on the e., and by Pontus on the n. During the time that it belonged to the Persian empire, however, it included Pontus, called Lesser Cappadocia. In A.D. 17, C. was erected into a separate province of the Roman empire, by Tiberius.

CAPPAGH BROWN, *kăp'păch*: a bituminous earth, which yields pigments of various shades of brown, the two most strongly marked being known as light and dark Cappagh brown. The coloring matters are oxide of manganese and iron. The C. browns are transparent and permanent; and when not applied too thickly, they dry well in oil. The name is derived from Cappagh, near Cork, Ireland. C. B. is also called encrome mineral, and more frequently, manganese brown.

CAPPARIDEÆ, *kăp-păr-î'dē-ē*, or CAPPARIDACEÆ, *kăp-păr-î-dā'sē-ē*: nat. ord. of exogenous plants, allied to *Cruciferae*, and including about 350 known species, herbaceous plants, shrubs, and trees, natives mostly of tropical and sub-tropical countries. The leaves are generally alter-

nate, stalked, undivided, or palmate; the flowers solitary or clustered; the calyx of four sepals, sometimes cohering in a tube; the corolla of four, or sometimes eight petals, sometimes wanting, the stamens generally a multiple of four, or indefinitely numerous, placed on a hemispherical or elongated disk; the ovary one-celled, the style thread-like or wanting; the ovules curved; the fruit either dry and pod-like (tribe *Cleomeæ*), or a berry (tribe *Cappareæ*).—To this order belongs the well-known caper-bush: see CAPERS. Many of the species possess stimulant properties; some are poisonous. One of the most interesting plants of the order is the Siwák (*Capparis sodata*), a bush or small tree, one of the most characteristic features of the vegetation of Africa, from the Great Desert to the Niger, the small berries of which have a pungent taste like pepper, and when dried, constitute an important ingredient in the food of the inhabitants of those regions; while the roots when burned yield salt.—*Barth's Travels*.

CAPPEL, *káp-pěł'*: village of Switzerland, canton of Zurich, 10 miles s.s.w. of the city of Zurich; interesting as the place where the great reformer Zwinglius was killed in a conflict with troops of the Rom. Cath. cantons, 1531, Oct. A monument has been erected here to his memory.

CAPPING VERSES, *kăp'pǐng* [Icel. *kapp*, contention (see CAP)]: in *familiar language*, contending in the citation of verses. To CAP, to beat one: see under CAP.

CAPREOLATE, a. *kăp'rě-ô-lăt* [L. *caprēolus*, tendril of a vine, a wild goat]: in *bot.*, having tendrils.

CAPRERA, *kâ-pră'râ*, or CABRERA, *kâ-bră'râ*: one of a group of small islands called the Buccinari Islands, in the Strait of Bonifacio, to the e. of the n. point of Sardinia (q.v.). They belong to the Italian province of Sassari. C. is separated from the coast of Sardinia by a strait of little more than a mile in breadth, and by a similar narrow strait from the island of Maddalena to the w. Its greatest length, from n. to s., is about six m., and its breadth two to three m. Like Maddalena and the rest of the Buccinari Isles, and the neighboring coast of Sardinia, C. is rocky, bare, and unfertile. It has no streams, and is in few places adapted either for the pasture of cattle or for the plow. In former times it was the abode only of wild goats—whence its name (L. and It. *capra*, a goat)—and rabbits, and was occasionally visited by goat-herds and fishermen. It has of late years acquired celebrity as the ordinary residence of Garibaldi, who acquired a property and built a house here 1854. The rest of the island was bought by friends, and presented to him some years after. Here he for the most part lived, save when on his military expeditions, or discharging his functions as a member of the Italian legislature at Rome. It was to C., his own beloved home, that he was sent by the Italian government in 1867, after his unfortunate attempt to overthrow the papal government; and here, 1882, June 2, he died.

CAFRI, *kâ'prě* (anc. *Caprææ*): charming island in the Mediterranean, at the entrance of the Bay of Naples, about

CAPRIC—CAPRICCIO.

three m. from Cape Campanella, 20 m. s. of the city of Naples. On its small area of about 11 m. circumference, it displays a rich variety of beautiful scenery, ruins of antiquity, and points of historical interest. The island is composed of two mountain masses, separated from each other by a depression like the seat of a saddle. That on the w. called Monte Solaro, which is the highest and largest, has an elevation of about 1,900 ft. The e. part is not more than 860 ft. above the sea. Pop. of the island (1881) 4,539.

At the base of the e. mountain is the town of C., built on a shelving rock, and guarded by walls, gates, and draw-bridges, with a cathedral. It commands a beautiful prospect, and communicates with the little town of Anacapri, on the western table-land, by a flight of 535 rude steps, cut in the face of the rock. There are only two safe landing-places on the island, and these are at the town of Capri, and near it. C. was a celebrated place, in the times of Augustus and Tiberius. Ruins are still found of Roman baths and aqueducts, and of the twelve grand villas or palaces built in honor of the twelve chief deities by the Emperor Tiberius, who passed the last ten years of his life here in the practice of the grossest licentiousness and cruelty. The inhabitants now consist of fishermen, sailors, and a few traders, with vine-dressers and cultivators of olives in Anacapri. Wherever a tree can be planted, the hopeful and industrious people have prepared for it a soil by persevering toil in terrace-culture. Delicious quails, which in vast numbers alight on the island during their migrations to and from Africa, in spring and autumn, are taken in nets, and form an important item in the resources of Capri. Pop. of town, including its district, abt. 4,000.

To the w. of the town of C. is situated the *Grotta Azzurra* (Blue Grotto), a remarkable cavern, entered from the sea by a narrow opening not more than three ft. high. Inside, however, it is of magnificent proportions, and of marvellous beauty, the georgious coloring being said to be due to the reflection and refraction of the sun's rays through the water. Elliptical in form, it has a length of 165 ft., a breadth of 100 in the widest part, and a height of 40 in the loftiest, with 48 ft. of water beneath.

CAPRIC, a. *kăp'rik* [L. *caper*, a he-goat]: obtained from butter, or the butter and fat of the goat. CAPRIC ACID, ϵ rank-smelling fatty substance found in butter, cocoa-nut, etc., whose flavor is very sour and burning. CAP'RATE, n. *-răt*, a salt of capric acid. CAPRIN, n. *kăp'rîn*, one of the fats found in butter. CAPROIN, n. *kăp-rō'in*, and CAPRYLIN, n. *kăp-rîl'in*, fats found in butter. CAPROIC ACID, one of the fatty acids with an odor of the goat. CAPRYL'IC ACID, an acid found, as well as the preceding, in rancid butter, cheese, cocoa-nut, etc.: see CAPROIC ACID.

CAPRICCIO, n. *ka-prĕ'chō* [It.]: in *Shakes.*, the Italian word used for CAPRICE (q.v.). *Capriccio* in *art* is a term applied to a picture or other work which designedly violates the ordinary rules of composition. Foliated orna-

CAPRICE—CAPRICORN.

ments, with Cupids or other figures appearing in them in situations not strictly natural, are capriccios. *Capriccio* in music, is a species of free composition, without being subject to rule as to form or figure. Locatelli, at the beginning of the 18th c., composed capriccios for the violin. The most celebrated C. of modern times is Mendelssohn's B. minor C. for pianoforte and orchestra.

CAPRICE, n. *kă-prēs'* [F. *caprice*, whim—from It. *capriccio*, a shivering, a whim—from L. *capra*, a goat: comp. It. *capo*, head; *rezzo*, an ague-fit]: sudden and slight desires to do or possess, as the starts in a shivering, or the capers of a goat; a sudden change of opinion or humor; a whim; a particular fancy. **CAPRICIOUS**, a. *-prish'ūs*, given to change; whimsical; fickle; apt to change opinions or intentions suddenly. **CAPRICIOUSLY**, ad. *-lī*. **CAPRICIOUSNESS**, n. fickleness in desires, feelings, fancies, or opinions. —**SYN.** of 'caprice': humor; whim; freak; fancy; fickleness; variableness; changeableness; vagary; — of 'capricious': arbitrary; whimsical; unsteady; captious; freakish; queer.

CAPRICORN, n. *kăp'rī-kawrn*, or **CAPRICORNUS** [L. *caper*, a goat; *cornu*, a horn], the *Goat*: a southern constellation, and the tenth sign of the zodiac (q.v.); denoted by the sign ♊, representing the crooked horns of a goat. It is usually represented on the globe as having the forepart of a goat, but the hinder part of a fish (see fig.). It is one of the least striking of the zodiacal constellations. It was, how-



Capricornus.

ever, celebrated among the ancients, who regarded it as the harbinger of good-fortune, and as marking the southern tropic or winter solstice, wherefore they called it the 'Southern Gate of the Sun.' It contains no large stars, the two largest, situated in the horns, being of the third magnitude. Neither of these rises above the horizon above n. lat. 50°. **TROPIC OF CAPRICORN**, the parallel of the s. hemisphere, whose latitude is equal to the sun's greatest declination, about 23° 28'. See **TROPICS**.

CAPRID—CAPRIMULGIDÆ.

CAPRID, a. *kăp'rid* [L. *caper*, a he-goat]: relating to the goat tribe. **CAP'RINE**, a. *-rin*, pertaining to a goat.

CAPRIDÆ, *kăp'rĭ-dē*: family of ruminant quadrupeds, which, as defined by some naturalists, may be described as the *Sheep and Goat* family, including the Linnæan genera *Ovis*, sheep (q.v.), and *Capra*, goat (q.v.); but which is extended by others to include antelopes, their persistent horns being regarded as the great distinction between them and the *Cervidæ*, or deer family. In the more restricted sense the name designates a very natural family, yet differing from the *Bovidæ* or ox family more in general appearance than in other characters; while links of connection with the antelopes are not wanting, a very remarkable one being found in the prong-horn of America.

CAPRIFICATION, n. *kăp'rĭ-fi-kă'shŭn* [L. *caprificārē*, to ripen figs by the stinging of the gall insect; *caprificus*, the goat or wild fig—from *caper*, a he-goat; *ficus* a fig]: method long employed in the Levant for securing and hastening the ripening of figs, and which consists in suspending fruit-bearing branches of the wild fig above or beside those of the cultivated tree. The notion once entertained, that this practice is analogous to that by which the fecundation of the female palm-tree is secured, is inconsistent with the now well-known fact, that the fig has both male and female flowers within its own receptacle; and it is therefore supposed that the effects of C. may result from the agency of a species of insect, of which the eggs have been deposited in the early wild figs, and which may promote fecundation by entering the receptacle of the cultivated fig, or perhaps by puncturing it may cause it to ripen sooner. In hope of a similar advantage, some French and English cultivators have inserted into figs straws dipped in olive oil. But C. is scarcely practiced in western Europe, and has even been discontinued as unnecessary in some parts of the east where it formerly prevailed.

CAPRIFOLIACEÆ, *kăp'rĭ-fō-lĭ-ă'sē-ē*: nat. ord. of exogenous plants, consisting of shrubs and herbaceous plants, which have opposite leaves without stipules, and flowers disposed in corymbs, in heads, or in whorls. The calyx is 4-5 cleft; the corolla monopetalous, tubular, or wheel-shaped, sometimes irregular. The stamens are adherent to the corolla at its base, and alternate with its lobes. The ovary is free, 1-5-celled. The fruit is generally a berry, sometimes dry, but not splitting open when ripe. The order is very nearly related to *Cinchonaceæ*, differing chiefly in the want of stipules. More than 200 species are known, natives chiefly of the temperate and colder parts of the n. hemisphere. To this order belong the honeysuckle, elder, viburnum, and snowberry. Emetic and cathartic properties are prevalent in it.

CAPRIMULGIDÆ, *kăp'rĭ-mŭl'jĭ-dē*: family of birds, of the order *Insessores*, and tribe *Fissirostres*, nearly allied to the *Hirundinidæ* or swallow tribe, but differing from them in the still greater width of gape, and in having long, stiff bristles at the base of the bill. They are insectivorous birds.

They have very long wings, short legs, and toes united at the base by a membrane. The European goatsucker may be said to be the type of the family, which includes also the whip-poor-will and night-hawk of America, with many other species widely distributed over the globe, and now arranged by naturalists in a number of genera.

CAPRIOLE, *n.* *káp'rí-ól* [see CAPER]: a leap which a horse makes without advancing; a leap or caper, as in dancing: *V.* to leap without advancing. CAP'RIO'LING, *imp.* CAP'RIOLED, *pp.* *-öld.*

CAPRIVI DE CAPRERA DE MONTECUCCULI, *ká-prē'vê dā ká-prā'rā dā mōn-tā-kók'kô-lē*, GEORGE LEO VON: soldier: b. Berlin, 1831, Feb. 24. His father was descended from an illustrious Italian family, and held a high legal office in Prussia. The son was educated at the Werder Gymnasium; entered the Kaiser Franz grenadiers as 2d lieut. 1849; was promoted 1st lieut. 1850; capt. 1859; aide to Gen. Slosch 1861; maj. 1866; lieut.col. and chief of staff of the 10th corps 1870; col., chief of dept., and gen. of staff 1872; maj.gen. 1877; and lieut.gen. 1882. He served with distinction in the Prussian campaigns of 1864 and 66; won high honors as chief of staff of the 10th corps at Metz, Orleans, and the following Loire campaign in the Franco-German war; became commander of the 30th corps at Metz 1882; and was appointed by Emperor William I. chief of admiralty and rear-admiral of the new German navy 1883. He completed the reorganization of the navy 1889, and was restored to the army and given command of the 10th corps, with headquarters at Hanover. Up to this time his life had been wholly spent in the milit. service, excepting the period in which he was reorganizing the navy, and he had never been concerned in public affairs. His naval administration showed him to be an officer of high executive power and rare adaptibility. Emperor William II. was greatly attracted toward him during the autumn manœuvres 1889, and when he accepted the resignation of Prince Bismarck (q v.) as chancellor of the empire 1890, Mar., he appointed C. his successor. Personally C. is a large, robust man, bearing such a remarkable resemblance to the 'iron chancellor' that he might readily pass for his brother. He is very deliberate in gait and speech, and uses few words. The new chancellor opened the Prussian diet 1890, Apr. 15, in a speech expressing his undying belief in the future of Prussia and of the German empire resting on Prussia's shoulders, and declaring that he would allow the widest scope to practical criticism, and would adopt what was good wherever it was found. He pledged himself to coöperate with all persons having at heart the interests of Prussia and aiming to foster the monarchic feeling in Prussia and the national feeling throughout the empire. He resigned his office, 1894, Oct. 26. D. 1889, Feb. 6.

CAPROIC ACID—CAPSICUM.

CAPROIC, *kăp'rō-ik*, and CAPRYLLIC, *kă-pril'lik*, and CAPRIC ACIDS, *kăp'rĭk* (see CAPRIC); represented by the formulæ $C_{12}H_{24}O_4$, $C_{16}H_{32}O_4$, and $C_{20}H_{40}O_4$: members of the acetic or fatty-acid series. They all may be obtained from butter by pressing out the portion which remains liquid at 60°, saponifying this oil, and distilling the soap which is thus formed with sulphuric acid. The liquid which passes over contains these three acids, together with butyric acid, which, by being converted into baryta salts, are separable from one another. All three of these acids are obtained also by the oxidation of oleic acid by nitric acid; and capric acid is also obtained by acting upon oil of rue with fuming nitric acid; hence it is frequently called *rutic acid*.

CAPRYL, n. *kăp'rĭl* [L. *caper*, a he-goat; Gr. *ulē*, matter of which a thing is made]: the radical of capric acid. CAPRYL'LIC ACID, an acid obtained from butter, cheese, yeast, etc. CAPRYLLIN, n. *kăp'rĭl-in*, a fat found in butter. CAP'RYLYL, n. *-rĭ-lil*, the radical of the capryllic series: see under CAPRIC.

CAPSALI, *kăp-săl'lē*: seaport town of the Ionian Islands, cap. of Cerigo, or Cythera; built upon a narrow ridge, terminating in a precipitous rock near the s. end of the island. It has an old castle and a good harbor. Pop. 2,000.

CAPSICUM, n. *kăp'sĭ-kŭm* [new L. *capsicum*—from L. *capsa*, a box, a chest]: red or Cayenne pepper, from Cayenne in French Guiana, of different species and varieties, ord. *Solanacēæ*. CAPSICINE, n. *kăp'sĭ-sĭn*, an alkaloid, the active principle in the capsules of Cayenne pepper, obtained in the form of a reddish oleaginous substance of exceeding acidity.

CAPSICUM—CAPSTAN.

CAPSICUM, *kăp'sî-kă'm*: genus of plants of the nat. ord. *Solanaceæ*, having a wheel-shaped corolla, projecting and converging stamens, and a dry berry. The species are all of a shrubby, bushy appearance, and have more or less woody stems, although they are annual or biennial plants. The number of species is very uncertain, some botanists distinguishing many while others regard them as mere varieties of a few. They are natives of the warm parts of America and of Asia, have simple leaves, and rather inconspicuous flowers, and some of them are in very general cultivation in tropical and sub-tropical countries for their fruit, which is extremely pungent and stimulant, and is employed in sauces, mixed pickles, etc., often under its Mexican name of *Chillies*; and when dried and ground, forms the spice called *Cayenne pepper*. As a condiment, it improves the flavor of food, aids digestion, and prevents flatulence. In tropical countries, it counteracts the enervating influence of external heat. In medicine, it is used as a stimulant, rubefacient, and vesicant; is often administered in combination with *cinchona*; and is particularly valuable both internally administered and as a gargle, not only in relaxed conditions of the throat, but in some of those diseases in which the throat is most dangerously affected. As a medicine, C. is administered in *pills* mixed with bread; in the form of *tincture*, obtained by digesting the bruised C. in alcohol; or of an *infusion*, procured by digestion in water, with varying proportions of salt and vinegar. A gargle of C. is prepared by infusing it in water, with candy-sugar and vinegar, and thereafter adding a little infusion of roses. It has no narcotic properties. It owes its power chiefly to *Capsicine* (q.v.). *Cayenne pepper* consists chiefly of the ground seeds. *C. annuum*, sometimes called Common C., or Chilly Pepper, is perhaps the most common species in cultivation. There are several varieties of it. The fruit is used either ripe or unripe, except for making *Cayenne pepper*, for which ripe fruit is employed. The fruit brought from S. America is sometimes sold by druggists under the name *Guinea pepper*.

CAPSIZE, v. *kăp-sîz'* [probably *cap*, top, head; and *seize*: Sp. *cabeza*, the head, or *cabecear*, to incline to one side: comp. Scot. *coup*, a fall—*lit.*, to pitch head foremost]: to throw head downward; to upset; to overturn. **CAP-SIZING**, imp. **CAPSIDED'**, pp. *-sîzd'*.

CAPSTAN, n. *kăp'stăn* [Sp. *cabrestante*, a capstan: old Sp. *cabra*, an engine for throwing stones: It. *capra*, an engine to raise ordnance]: on *shipboard*, ponderous mass of timber (or smaller in size of iron), whose uses are to heave the anchor, hoist up masts and guns, take in and discharge cargo, etc. It has very firm supports on the deck underneath it. It comprises a *barrel*, round which a rope or a chain coils; *whelps*, or pieces of timber, which enlarge the diameter without greatly increasing the weight; the *drum-head*, a polygonal flat piece of timber at the top, pierced laterally with holes; the *step*, or lowest part, which rests

CAPSULE—CAPTAIN.

upon and is bolted to the beams; the *saucer*, an iron socket let into the top of the step, the *pivot* or *spindle*, which, resting on the saucer, forms the axis around which the C. turns; the *pawls*, short bars of iron, to prevent the reaction of the C.; *bars*, which enter the holes, and are the levers for enabling the sailors to work the C.; *pins*, placed vertically through the drum-head, for temporarily retaining the bars in their places; and the *shifter*, a rope connecting the outer ends of the bars. Among many improvements made in the arrangement and action of capstans is Wardill's, for increasing the bite or holding of a chain-cable around the circumference. In large vessels capstans are generally worked by steam.

CAPSULE, n. *kăp'sûl* [F. *capsule*—from L. *capsûla*, a little chest—from *capsa*, a chest]: a covering for the corks or stoppers of bottles for the more effectual exclusion of air; a small smooth thin box, round or oval, made of some neutral and easily-soluble substance, for inclosing bitter or otherwise disagreeable medicines, to facilitate the swallowing of them; in *bot.*, the seed-vessel of a plant, usually applied to a dry, many seeded fruit; in *anat.*, a membranous bag inclosing an organ; in *chem.*, a china saucer for roasting. **CAP'SULAR**, a. *-lér*, or **CAP'SULARY**, a. *-lér-î*, hollow; full of cells. **CAPSULATE**, a. *kăp'sû-lăt*, or **CAP'SULATED**, a. *-lă-těd*, inclosed in a capsule, or as in a box.

CAP'SULE, *kăp'sûl*, in Botany: a dry fruit, *syncarpous* (or formed of several carpels united together into one), and opening either by valves, as in the fox-glove, primrose, and rhododendron, or by pores near the summit, which some regard as a sort of valves, and of which beautiful examples may be seen in the poppy and snapdragon. Capsules are either one-celled or many-celled. The *Pyxidium* is a variety of C., which opens as if cut around near the summit, presenting the appearance of a cup with a lid, of which a very beautiful example may be seen in the *Anagallis*, or Pimpernel; and another in the great woody fruit of the different species of *Lecythis* and other *Lecythidaceæ*.

CAPTAIN, n. *kăp'tîn* [F. *capitaine*; It. *capitano*—from mid. L. *capitānēſ*, a military chief—from L. *caput*, the head]: an officer who commands a company of foot, a troop of horse-soldiers, or a ship; a leader or chief. **CAPTAIN-GENERAL**, the commander-in-chief, as of an army, or sometimes a province. **CAP'TAINCY**, n. *-sî*, the rank or commission of a captain. **CAP'TAINSHIP**, n. the condition, rank, or authority of a captain; chieftainship.

CAPTAIN, *kăp'tîn*, or *kăp'tîn*, **MILITARY**: the most general designation given to an officer of land forces; something equivalent to it being found in most European languages. *Captain-general* is in some countries a very high command. In the time of Queen Elizabeth, there was among other high English military officers, a cap-gen. of footmen. In the organization of the British army at the present day, there is one C. to every *company* of infantry and every *troop* of cavalry. Formerly every bat-

CAPTAIN—CAPTION.

tery of artillery had two captains—a first and a second, the latter being called C.-lieut. Now, the first in command has the title of major, and the second that of C. The first in command of a battery of artillery, even when styled C., was considered higher than a C. of infantry or cavalry, and was privileged to be mentioned by name in military despatches like colonels and majors.

The duty of the C. is to see to the men of his company in everything that relates to discipline, exercises, billeting, pay, settlement of accounts, mess, kit, clothing, arms, ammunition, accoutrements, stores, barracks, cooking, etc.; to receive orders concerning these matters from the major, and to enforce these orders among the men. He is responsible to the major, and is assisted in his duties by the lieut. and sub-lieut.—in the U. S. army, the first and second lieuts. For the former value of a British C.'s commission, and its purchase, see COMMISSIONS, ARMY: PURCHASE SYSTEM.

The position and duties of a C. in the U. S. army are much the same as in the British service: A C. ranks next above a lieut. and next below a major.

CAPTAIN, NAVAL: general designation for the commander of a ship. It is not universal, for some vessels of war are commanded by officers lower in rank than C.; while the chief officer of a merchant-vessel is often called *master*. The commanders of all rated ships are captains. The captains rise to the command of larger and larger ships, with increase of pay, according to length of service. The C. is responsible for everything on shipboard, in discipline, navigation, equipment—all, in short, that concerns the *personnel* or the *matériel* of the ship. If his ship belongs to a particular fleet or naval station, he is responsible to some admiral or commodore; if not, he is directly responsible to the naval dept. The C. of that particular ship in a fleet which carries the admiral is called *flag-C.*, and is for the occasion higher in rank than others. A naval officer when not attached to a ship in actual commission is on half-pay. A C. in the U. S. navy ranks next below a flag-officer, and with a col. in the army.

The word C. is used in other ways also in the navy. The *C. of the fleet* is a temporary officer in large fleets; he promulgates the admiral's orders, and receives all the reports and returns, filling, in short, a post equivalent to that of *chief of the staff* in an army. Among the seamen on board a ship, the chief of each gang is called C.; such as the C. of the after-guard, of the fore-castle, of the hold, of the main-top, of each gun, etc. There are also *captains of marines*, whose rank is with lieuts. in the navy and with C.s in the army.

CAPTION, n. *kăp'shŭn* [mid. L. *captiōnem*, detention—from L. *capĭō*, I seize]: a title or heading; in *OE.*, a taking unawares by a trick; in *law*, the part of a legal writ which asserts its authority; less strictly in England, but properly in Scotland, an arrest: see INDICTMENT: COMMISSION: DILIGENCE: WARRANT: HORNING.

CAPTIOUS—CAPTURE.

CAPTIOUS, a. *kăp'shŭs* [L. *captiŭsus*, captious, deceptive—from *capĕrĕ*, to take: F. *captieux*]: disposed to find fault; apt to cavil or raise objections; insidious. **CAPTIOUSLY**, ad. *-lĭ*. **CAPTIOUSNESS**, n. disposition to find fault.—**SYN.** of 'captious': cavilling; censorious; carping; critical; peevish; insnaring; insidious.

CAPTIVATE, v. *kăp'tĭ-văt* [L. *captivus*, taken prisoner—from *capĕrĕ*, to take; *captus*, taken: F. *captiver*, to enslave]: to take prisoner; to charm or subdue by beauty; to gain by excellence in manners or conduct; to enslave in love. **CAPTIVATING**, imp.: **ADJ.** so pleasing and delightful as to enchain the judgment and affections; bewitching. **CAPTIVATED**, pp. **CAPTIVA'TION**, n. *-vă'shŭn*. **CAPTIVE**, n. *kăp'tiv*, a prisoner taken in war; one who is charmed by beauty or enslaved by love: **ADJ.** made prisoner in war. **CAPTIV'ITY**, n. *-ĭ-tĭ*, bondage; the state of being in the power of an enemy; state of being under subjection or control. **CAP'TURE**, n. *-tŭr*, the act of taking or seizing by an enemy, as a ship; the thing taken; a prize; seizure, as of a criminal: **V.** to take or lay hold of by force; to seize by stratagem. **CAP'TURING**, imp. **CAP'TURED**, pp. *-tŭrd*. **CAP'TOR**, n. *-tĕr*, one who seizes or captures, as a ship.—**SYN.** of 'capture': to enchant; charm; fascinate; enrapture; enslave; subdue; overpower;—of 'captivity': imprisonment; confinement; incarceration; bondage; slavery; immuring; servitude; subjection;—of 'capture, n.': seizure; prize; detention; arrest.

CAPTURE, *kăpt'yŭr*, in International Law: prize taken in time of war. The law on this subject is stated with precision in a paper addressed on behalf of the British government to the American ambassador at London, 1794, Sep.: 'When two powers are at war they have a right to make prizes of the ships, goods, and effects of each other, upon the high seas. Whatever is the property of the enemy, may be acquired by capture at sea; but the property of a friend cannot be taken, provided he observes his neutrality. Hence the law of nations has established—that the goods of an enemy on board the ship of a friend may be taken—that the lawful goods of a friend on board the ship of an enemy ought to be restored—that contraband goods going to the enemy, though the property of a friend, may be taken as prize; because supplying the enemy with what enables him better to carry on the war, is a departere from neutrality.'

During the Russian war in 1854, there appeared in the *London Gazette*, under date March 28, a declaration stating *inter alia*, that her majesty would waive the right of seizing enemy's property laden on board a neutral vessel, unless it be contraband of war, and that it was not her majesty's intention to issue letters of marque for the commissioning of privateers. The right of seizing enemy's property on board a neutral vessel, whether contraband of war or not, had always before been maintained by England. On the re-establishment of peace with Russia, a treaty was signed, and the following declarations adopted: 1. Privateering is and

CAPUA—CAPUCHIN.

remains abolished; 2. A neutral flag covers an enemy's goods, with the exception of contraband of war; 3. Neutral goods, with the exception of contraband of war, are not liable to C. under an enemy's flag; 4. Blockades, in order to be binding, must be effectual—that is to say, maintained by force sufficient in general to prevent effectually access to the coast of the enemy.

As to the right to property captured from the enemy, and its distribution as prize or booty of war among the officers and men of the army and navy, see **BOOTY: PRIZE**: see also **INTERNATIONAL LAW**.

CAPUA, *kăp'û-a*: fortified city of Italy, province of Caserta; beautifully situated in a rich plain, on the left bank of the Volturno, about 18 m. n. of the city of Naples, with which it is connected by railway. It is a military station of the first class, its defenses having been greatly extended and improved by Vauban. As it is the only fortress which guards the approach to Naples from the n., it was regarded as one of the keys of the former kingdom of that name. The only objects of interest in the city are the cathedral, with some splendid granite columns from ancient *Casilinum*, upon whose site C. was built in the 9th c.; the church of the *Annunziata*, with some bas reliefs; and the arch of the *Piazza dei Giudici*, under which many ancient inscriptions still exist. Pop. 12,000.

The ancient *Capua*, which enjoyed a reputation for wealth and population second only to Rome and Carthage, was about two m. s. e. of the present city, where its ruins are still seen, its site being occupied by the modern town of Santa Maria di Capua. C. was founded by the Etruscans, under the name of *Volturnum*, as early, according to some authorities, as B.C. 800, and was the chief city of the 12 said to have been founded by them in this part of Italy. Its present name was derived from the Samnites, who captured it B.C. 423. After the battle of Cannæ, B.C. 216, the popular party opened the gates to Hannibal, whose army was greatly enervated by its luxurious winter-quarters here. The Romans obtained possession of the city B.C. 211. In the 5th c., after Christ, C. was devastated by the Vandals under Genseric. It partially recovered its prosperity, but was totally destroyed by the Saracens 840. The citizens, who had fled to the mountains, were induced by their bishop to return, some 16 years later, and found the modern Capua. From the existing remains of the walls and fortifications of ancient C., it has been estimated that it had a circumference of 5 or 6 m. It had seven gates. Among the Roman antiquities, one of the most remarkable is the amphitheatre, built of bricks, and faced with white marble. Well-preserved arches, corridors and seats for spectators, remain. It is calculated to have been capable of holding 60,000 persons, and must have been altogether one of the most magnificent buildings of the kind in Italy.

CAPUCHIN, n. *kăp'û-shên'* [**F.** *capucin*—from *capuce*, a cowl—from It. *cappuccio*, a cowl (see **CAP**)]: a monk belonging to a branch of the order of St. Francis (see **FRAN-**

CAPUCHIN MONKEY—CAPULETS.

CISCANS), designated from the *capuche*, which is their head-dress; their rule is mainly the same as that of the Minorites. Their founder and the superior of their first convent, was Matthew de Bassi, a Franciscan of Ancora, and they were authorized 1528, by Pope Clement VII. They have made many converts, and had, by recent reports, more than 80 missions in Europe, Asia, Africa, East Indies, and S. America. They have establishments in New York, New Jersey, and Wisconsin. C. is the name of a cloak and hood for females; also a kind of small monkey.

CAPUCHIN MONKEY, *kăp-û-shên' mŭng'kĭ*, or CAPUCHIN SAPAJOU, *kăp û-shên' săp'a-jô*: name often given to *Cebus capuchinus*, and some other species of the genus *Cebus*, S. American monkeys, which have the head covered with short hair, so disposed as to resemble the cowl of a capuchin, the face being almost naked, or covered only with a little



Capuchin Monkey (*Pithecia Chiropotes*).

down: see CEBUS. *Pithecia chiropotes*, a S. American monkey of a genus allied to *Cebus*, is also sometimes called the C. M., or Capuchin of the Orinoco.

CAP'UDAN-PASHA': see CAPITAN-PACHA.

CAPULETS AND MONTAGUES, *kăp'û-lĕts and mŏn ta-gŭz*: English spelling of the names of the Cappelletti and Montecchi, two noble families of n. Italy, memorable chiefly from their connection with the legend on which Shakespeare has founded his play of *Romeo and Juliet*. According to tradition, both families belonged to Verona; but this does not appear historical. The Cappelletti were of Cremona, and the fact that their burying-ground and the tomb of Juliet are shown at Verona, only proves how easy it is, in a country of ruins like Italy, to connect fact with fable. It has also been asserted that one family was Guelph and the other Ghibelline; but this is disproved by a reference to them in the *Purgatorio* of Dante (canto vi. l. 106). The poet is blaming the Emperor Albert for neglecting Italy, the very

CAPUT MORTUUM VITRIOLI—CAPYBARA.

garden of his domain. 'Reckless man,' he says, 'come see how the Montecchi and the Cappelletti are oppressed;' and the context shows that the Guelphs were the oppressors in both cases of these great Ghibelline families. The Emperor Albert was murdered in 1308, and this event has supplied the Veronese with a date for their legend. The first publication in which we recognize the essential incidents of Shakespeare's play is the novel *La Giulietta*, by Luigi da Porto, printed 1535, after the death of the author. He states, in an epistle prefixed to the work, that the story was told him 'by one Perigrino, a man fifty years of age, much experienced in the art of war, a pleasant companion, and, like almost all the Veronese, a great talker.' In 1554, Bandello published in his collection of tales another Italian version of the legend. It was entitled *The unfortunate Death of two unhappy Lovers, the one by Poison and the other of Grief*. Both writers fix the date of the event by saying it took place when Bartholomew della Scala or Scaliger ruled Verona. A French version of the tale was published by Pierre Borsteau in Belleforest's *Histoires Tragiques*. It was translated into English 1567, and published in Painter's *Palace of Pleasure*. About the same time, Arthur Brooke published an English poem on the same subject, entitled *The Tragical History of Romeus and Juliet, written first in Italian by Bandell, and now in English*. There is evidence that an English play had appeared previously, and that before Shakespeare's time the story was so well known in England that it had supplied subjects for tapestries. Shakespeare's play seems to have been based principally on the English poem. It was Brooke who first called the Montecchi Montagues, and the Prince of Verona Escalus, instead of Scala. Wright and Cary, in translating Dante, have followed the example of Shakespeare, and render the Italian names of the *Divina Commedia* into the familiar 'Capulets and Montagues' of *Romeo and Juliet*. The historical date of the tragedy has not, however, been adopted by modern stage managers and Shakespearian critics, who very properly bring down the action from the beginning to the close of the 14th c., when commercial opulence, and the revival of arts and letters, supply accessories more in keeping with the drama than the ruder age to which history must assign the fall of the Capulets and Montagues.

CAPUT MORTUUM VITRIOLI, *kā'pūt maw'r'tū-ūm vīt-rī'ō-lī*, or COLCOTHAR, *kōl'kō-thār*: name given by the alchemists to the red powder (mainly red oxide of iron) which remains in the retorts when green vitriol or the sulphate of iron is calcined.

CAPYBARA, n. *kă-pī'bă-ră* [native name], (*Hydrochærus Capybara*): quadruped of the order *Glires* or *Rodentia*, and of the family *Cavidae*, strongly resembling the cavy or Guinea-pig, although it is the largest existing rodent known, and aquatic in its habits. It is a native of S. America, and abounds in many of the large tropical rivers. It is equal in size to a small pig. The dentition resembles that of the cavy, except that the grinding teeth are composed of numerous

transverse plates, the number of the plates increasing as the animal advances in age; an interesting point of resemblance to the dentition of the elephant, and a link of connection



Capybara (*Hydrochærus Capybara*).

between the rodents and the pachydermata. The C. feeds exclusively on vegetable food, browsing on the grass near the rivers, and often committing great ravages in plantations of sugar-cane. It runs badly, but swims and dives well, and has the power of remaining under water seven or eight minutes. It is very inoffensive, and easily tamed. The flesh, except that of old males, is good for food. The C. is sometimes called water-hog, of which *Hydrochærus* is a Greek translation. In Demarara it is called water-horse, a corruption of the Dutch *Water Haas*—i. e., water-hare.

CAR, n. *kâr* [OF. *car*; F. *char*, a car—from L. *carrus*; It. *carro*, a car, a cart: W. *car*, a raft, a frame: Dut. *karren*, to creak]: a small light carriage drawn by one horse; a railway carriage; a chariot of war or triumph; a large omnibus for street and road traffic whose wheels run in the grooves of iron rails. CAR'MAN, n. the driver or conductor of a car.

CARABIDÆ, *kâr-ăb'î-dē*: tribe of beetles, or coleopterous insects, of the section *Pentamera* (see COLEOPTERA), corresponding with the genus *Carabus* of Linnæus, but of which the species are extremely numerous, those already known being numbered by thousands. They feed mostly on other insects, worms, etc., and are extremely voracious and active, habits which are fully shared by their larvæ. Some of them burrow in the earth; most of them live under stones, under the bark of trees, among moss, etc., and their bodies are adapted to this mode of life, being very firm and hard. Their legs are in general long and most of them pursue their prey rather by the use of their legs than of their wings, some of them indeed being wingless, or having only rudimentary wings. Many of them have much beauty of colors and metallic lustre.

CARABINE—CARACAL.

Some of the species of the restricted genus *Carabus* are among the most common British insects. Their wings are



Mormolyce phyllodes.

not fitted for flight.—A very large and singular insect of the tribe C. is *Mormolyce phyllodes*, native of Java, which, in consequence of the extremely depressed form of its body, resembles some of the *Mantidæ* (q. v.), and the insects known as leaf-insects (q.v.). To this tribe belong also the bombardier beetles, which see.

CARABINE, n. *kâr'ă-bîn*, or CARBINE, n. *kâr'bîn* [F. *carabine*—from It. *carabina*, a rifle: mid. L. *calabrînus*, a light cavalry from *Calabriă*]: a short gun carried by a cavalry soldier. CAR'ABINEER', or CAR'BINEER', n. *-bî-nēr'*, one who carries a carabine.

CARABOBO, *kă-ră-bō'bō*: n. w. state or province of Venezuela, bounded on the n. by the Caribbean Sea, e. by Caracas, Aragua, and Guarico, s. by Portuguesa, and w. by Barinas, Barquisimeto, and Coro; 2,984 sq. m. The n. part is mountainous, the s. level. C. has many streams and lakes, and is divided into seven cantons and 33 parishes. The climate is warm but not unhealthful. Agriculture and cattle-raising are chief occupations: coffee, cacao, sugar, indigo, hides, cotton, and tobacco are exported. The cap. and chief town is Valencia, the principal port Puerto Cabello. Pop. (1891) 198,021.

CAR'ABOU: see REINDEER.

CARACAL, n. *kâr'ă-kāl* [said to be Turk. *qarahqootaq*, black-ear], (*Felis Caracal*): species of lynx (q.v.), found in the warmer parts of Asia, and throughout Africa; and more probably than any European species, the lynx of the ancients. It is larger than a fox, about the same height, but much more powerful; of a uniform deep brown or wine-red color, except two spots near each eye, the under parts of the body, and inner parts of the legs, which are white, and tufts of long black hair which terminate the ears. The C. is powerful enough to tear a hound to pieces. It is often represented as of a very savage dispo-



Caracal (*Felis Caracal*).

sition ; but it is capable of being tamed, and has been employed in hunting.

CARACALLA, *kar-a-kāl'la*, properly named MARCUS AURELIUS ANTONINUS BASSIANUS, Roman emperor: A.D. 188–217, Apr. 8 ; b. Lyon ; son of the Emperor Septimius Severus. He was playfully named by his father Caracalla, from his long-hooded tunic, made in the fashion of the Gauls, and so called in their language. After his father's death, 211, he ascended the throne as coregent with his brother Publius Septimius Antoninus Geta, whom he afterward caused to be murdered. Having bribed (at enormous cost) the Prætorians to overlook this foul deed, and to make him sole emperor, C. next directed his cruelty against all the friends and adherents of Geta, of whom 20,000 of both sexes—including the great jurist Papinianus—were put to death. Innumerable acts of oppression and robbery were employed to raise supplies for the unbounded extravagance of the despot, and to pay his soldiers. In his famous constitution, he bestowed Roman citizenship on all his free subjects not citizens—who formed the majority, especially in the provinces—but simply in order to levy a greater amount of taxes on releases and heritages, which were paid only by citizens. In his campaigns, he imitated, at one time, Alexander, at another time, Sulla, while his main object was to oppress and exhaust the provinces which had been in a great measure spared by the tyranny of former emperors. He was assassinated, at the instigation of Macrinus, prefect of the Prætorians, by one of his veterans named Martialis, on the way from Edessa to Carrhæ. Historians paint the life of C. in the darkest colors. Among the buildings of C. in Rome, the baths—Thermæ Caracallæ—near Porta Capena were most celebrated, and their ruins are still magnificent.

CARACARA, *kā-ra-kā'ra*, or CARACARA EAGLE (*Polyborus*): genus of birds of prey peculiar to America, re-

CARACAS—CARACCI.

garded as a connecting link between eagles and vultures ; agreeing with the former in their strongly-hooked bill and claws, but with the latter in their naked face and propen-



Caracara (*Polyborus Braziliensis*).

sity to prey on carrion. The name C., originally Brazilian, is derived from the peculiar hoarse cry of a common Brazilian species (*P. Braziliensis*), a bird of very fine plumage, about 50 inches in expanse of wings, which is of frequent occurrence over a large extent of the American continent, and is sometimes seen in the southern United States.

CARACAS, *kâ-râ'kâs*: district of Venezuela, extending in n. lat. from $7^{\circ} 38'$ to $10^{\circ} 46'$, and in w. long. from $65^{\circ} 30'$ to 68° . With a generally mountainous interior, the immediate coast is flat, presenting, besides La Guayra, several harbors or roadsteads. Exports are cocoa, coffee, dye-woods, hides, indigo, and sarsaparilla. Pop. 300,000.

CARA'CAS: capital of the republic of Venezuela, most northerly state in S. America ; with Guiana on the e. and Colombia on the w.; lat. $10^{\circ} 30'$ n. and long. $67^{\circ} 5'$ w., 16 m. s. of La Guayra, its port, with which it is joined by railway. It is 2,880 ft. above tide-level, which elevation gives it healthful air and a temperature so moderate as to average 68° F. in Feb., and 72° in June. Standing immediately above the confluence of four streams, it is well supplied with cool water, distributed by means of fountains, pipes, and reservoirs. The neighborhood is subject to earthquakes—12,000 citizens having, in 1812, perished from this cause. The streets are straight and regular. The most splendid edifice is the church of Alta Gracia, for the people of color, excelling the cathedral in the richness of its decorations. C. has a university founded 1778. Pop. (1883) 70,509 ; (1891) 72,429.

CARACCI, *kâ-rât'chê*, or CARRACCI, *kâr-rât'chê*: cele-

brated family of Italian painters, founders of the Bolognese school of painting.

LUDOVICO C.: 1555-1619; b. Bologna; son of a butcher. As a student, he was so inapt that his master recommended him to abandon the pursuit; but instead, he went to Venice and Parma, making acquaintance with the works of the great masters there, and returned to Bologna imbued with art principles quite opposed to the superficial mannerism prevailing in his native city. In conjunction with two of his cousins, who, instructed by him, had imbibed the same ideas, he founded, in spite of great opposition, the school which afterward became so famous in the history of painting. The first principle of this new school was that 'observation of nature ought to be combined with imitation of the best masters.' The allied artists found numerous pupils, to whom they gave practical instructions in drawing from natural and artistic models, with theoretical lessons on perspective, anatomy, etc. So great was their success that, in a short time, all other schools of painting were closed in Bologna. Some of the finest works of this master are preserved in the *Accademia delle Belle Arti*, Bologna—among others, the *Madonna and Child Throned*, *Madonna and Child Standing*, the *Transfiguration*, and the *Nativity of St. John the Baptist*.

AGOSTINO C.: 1558-1602; b. Bologna; cousin of Ludovico C. He became a disciple of his cousin, but he was too versatile a genius to devote himself closely to any subject, though his magnificent painting of the *Communion of St. Jerome* shows that he might have attained great eminence, had he given undivided attention to the art; but he was in the habit of abandoning his easel for literature, poetry, and engraving on copper. As an engraver, indeed, he holds an important position in Italian art. He accompanied his younger brother, Annibale, to Rome, and there assisted in some of the paintings in the Farnese Gallery; but his brother, who was a slave to his art, soon quarrelled with him for his inattention, and he left Rome and went to Parma.

ANNIBALE C.: 1560-1609; b. Bologna; brother of Agostino. He learned, under his father, the business of a tailor, from which he was called away by Ludovico C. His progress in the study of painting was rapid, and at first he took principally for his models Correggio, Titian, and Paul Veronese. His picture of *St. Roche distributing Alms*, first gained for him wide reputation. His fame reached Rome, and he was employed to paint the Farnese Gallery there, which is considered his greatest work, and the manner of which partakes somewhat of Raphael and Correggio. On this gallery he was employed some eight years, and he received for his work the incredibly paltry sum of 500 crowns. In disgust and vexation, the artist threw aside his pallet. He died in Rome, where his remains were interred close to Raphael's tomb, in the Pantheon. Annibale C. was one of the greatest followers of Correggio, and in composition approached most nearly the style of Raphael. Ludovico C. had a greater talent in

CARACCIOLI—CARADOC BEDS.

teaching, and Agostino C. had a more versatile invention, but Annibale was unquestionably the greatest artist of the three Caracci.

ANTONIO C.: 1583-1618; b. Venice; natural son of Agostino, pupil under Annibale C.; painted some excellent pictures.

FRANCESCO C. (styled FRANCESCHINI): 1595-1622; brother of Agostino and Annibale C.; eminent designer.

The best Italian masters of the 17th c.—Domenichino, Guido Reni, Albani, and others—proceeded from the school of the Caracci.

CARACCIOLI, *kâ-rât'cho-lē* or *kâ-rât-cho'lē*: Neapolitan family, unfortunately associated with the memory of Lord Nelson. Several members of this family were employed in political offices.

LOUIS ANTONIO DE C.: 1721-1803; b. Paris; author of a pseudograph, entitled *Lettres Intéressantes du Pape Clement XIV.*, which mystified many readers throughout Europe.

FRANCESCO C.: meritorious Neapolitan admiral, entered in early life the marine service, and distinguished himself at Toulon, 1793. In the year 1798, the offensive conduct of the court of Naples toward C. induced him to return from Palermo, where the court was then residing, to Naples, where he entered into the service of the republic established by the French invaders, and, with a few vessels, prevented the attempted landing of a Sicilian and British fleet. In 1799, when Ruffo took Naples, C. was arrested, contrary to the terms of capitulation, sentenced to death by the junta hanged on the mast of a frigate, and his corpse thrown into the sea. This affair, to which Lord Nelson was a consenting party, is a stain on the reputation of the English admiral.

CARACOLE, n. *kâr'ă-kōl* [F. *caracole*, a gambol—from Sp. *caracol*, a winding staircase: Gael. *car*, a twist: AS. *cerran*, to turn]: the half-turn which a horseman makes to the right or left, sometimes performed repeatedly by a cavalry troop in charge to mislead the enemy as to the point of attack; in *arch.*, a winding staircase.

CARACTACUS, *ka-răk'ta-kūs*: King of the Silures, who inhabited South Wales 1st c. He was one of the most persistent enemies of the Romans in Britain. For nine years he warred gallantly against the invaders, but at length was completely overthrown. His wife and daughters fell into the hands of the victors, and his brothers surrendered. C. fled to Cartimandua, Queen of the Brigantes, who delivered him up to the Romans. He was carried to Rome, A.D. 51, and exhibited to the people by the Emperor Claudius. When he approached the imperial seat, we are told, he addressed Claudius in so noble a manner that he and his relatives were immediately pardoned. They appear, however, to have lived during the remainder of their lives in Italy.

CARADOC BEDS, *kâr'ă-dōk*, also BALA BEDS, in *Geology*: the upper member of the Lower Silurian system, so named from their development at Caer Caradoc, Shropshire.

CARAFE—CARAMNASSA.

They consist of sandstones, grits, and slates, with occasional beds of limestone. Enormous masses of contemporaneous igneous rocks are interstratified with them. They attain a thickness of 9,000 ft., not including the igneous rocks. Fossils are very abundant in some beds, chiefly Trilobites (q. v.), Brachiopoda (q. v.), and Graptolites, which see.

CARAFE, n. *kār-ăf* [F. *carafe*—from It. *caraffa*, a decanter]: a glass water-bottle or decanter for the table or toilet.

CARAGEEN, or **CARRAGEEN**, n. *kār'ă-gēn*: Irish moss or pearl moss; a name in Ireland for the sea-weed *Chondrus crispus*, ord. *Algæ*, used when dried for feeding cattle, and as a nutritious article of diet: see **CARRAGEEN**.

CARAGLIO, *kā-rāl'yo*: town of n. Italy, province of Coni, 6 m. w. of the city of that name. It is on the Grana, and has manufactures of silk. Pop. (1872) 3,379.

CARAITE, n. *kār'ā-īt* [Rabbinical Hebrew, *kharai*, textual]: one of a Jewish sect who reject the Cabala, the Talmud, and all traditions, holding to the books of the ancient canon alone; also spelled **KARAITE**: see **JEWISH SECTS**.

CARAMANIA: see **KARAMAN**.

CARAMBOLA, *ka-rām'bō-la*, or *kar-am-bō'la*: East Indian fruit of the size and shape of a duck's egg, but with five acute angles, or longitudinal ribs. It has a yellow, thin, smooth rind, and a clear watery pulp, in some varieties sweet, in others acid, of very agreeable flavor. It is often used in making sherbets, and in tarts and preserves; and is known to the British in India as the *Coromandel Gooseberry*. It is one of the most universally cultivated and abundant fruits of India. It is produced by the *Acer-rhoa Curambola*, a small evergreen tree, or bush, of the nat. ord. *Oxalidæ*. The **BILIMBI**, or **BLIMBING**, is the very acid fruit of another species of the same genus, *A. Bilimbi*, also East Indian. Both species are now much cultivated in tropical America. Both exhibit an irritability of leaf resembling that of the sensitive plant; they also display in a remarkable degree the phenomena known to physiologists as those of Sleep of Plants, which see.

CARAMEL, n. *kār'ă-mēl* [F. *caramel*—from Sp. *caramelo*, sugar-candy]: burnt sugar; a dark brown and nearly tasteless substance obtained by heating sugar to about 400°: see **SUGAR**. It is likewise formed during the roasting of all materials containing sugar, such as coffee, chicory, and malt (see **BEER**), and is one cause of the dark color of porter and infusions of coffee. It is used in the coloring of whisky, wines, vinegar, etc.

CARAMNASSA, *kā rām-nās'sā*: river in the presidency of Bengal, which rises in lat. 24° 34' n., long. 83° 46' e., and, after a course of about 150 m., enters the Ganges from the right in lat. 25° 28' n., long. 83° 58' e. Though, on issuing from its source, it is clear as crystal, it is said to be both nauseous and noxious—a peculiarity which the

CARANA RESIN—CARAT.

natives impute to various supernatural causes. About 50 m. from its mouth, it is crossed by a stone bridge of three wide arches, which forms part of the grand road from Calcutta to Delhi. It is so exceptionally subject to floods that it has been known to rise 25 ft. in a night, when scarcely any rain had fallen in the adjacent plain of the Ganges itself.

CARANA RESIN, *ka-rá'na*, or *ka-răn'a*, *rěz'ın*, more commonly, but less correctly, called GUM CARANA: resinous substance procured in tropical America. Its properties and uses resemble those of tacamahac. It is entirely soluble in alcohol, and melts in a slight heat. It is not known what tree produces it.

CARANJA, *ká-rân'já*: island on the e. of the ordinary entrance of the harbor of Bombay (q.v.), separated from the mainland by a narrow and unserviceable channel four m. in length. C. is two m. broad, comparatively level and fertile, with the exception of two hills—the Little Hill in the n., and the Great in the south.

CA'RANX: see SCAD.

CARAPA, *kăr'a-pa*: genus of plants of the nat. ord. *Meliaceæ*, natives of warm climates. *C. Guianensis*, or *guareoides*, sometimes called the Anderaba, also the C. tree, is a large tree with beautiful shining pinnate leaves which have many leaflets, native of Guiana and the adjacent countries, where its bark has great reputation as a febrifuge, and the oil obtained from its seeds is much used for lamps. Masts of ships are made of its trunk. The oil, called oil of C., is thick and bitter, and is anthelmintic.—*C. Touloucouna*, or *Guineensis*, an African species, yields a similar oil, used by the negroes for making soap, and for anointing their bodies, its bitterness protecting them from the bites of insects, a purpose to which the oil of C. is also applied in S. America.—These species are very similar, and are supposed by some botanists not essentially distinct.

CARAPACE, n, *kăr'ă-pās* [F. *carapace*—from Sp. *cara-pacho*—from Gr. *karabos*, a crustaceous animal like the crab or lobster]: the crustaceous and horny coverings of chelonian reptiles (tortoises and turtles), and of the *Crustacea Malacostraca* (crabs, lobsters, etc.); strictly the upper half of the shell of such animals, the lower being the plastron. In animals so widely different, however, there is only a general similarity in the appearance and the purpose of the C.; its organic relations are very different: see CHELONIA: CRUSTACEA.

CARAT, n. *kăr'ăt* [F. *carat*—from It. *carato*, a carat: Ar. *kirat*, a small weight; *kuara*, name of the *Erythrina Abyssinica*, or coral-tree, an African plant whose beans were used as weights for gold]: weight commonly used for weighing precious stones, and particularly diamonds. According to some authorities, the name comes through the Arabic *qirrat* from the Greek *keration*, the fruit of the

CARAUSIUS—CARAVAGGIO.

Carob (q.v.) or locust tree (*Ceratonia siliqua*) used as a weight.

Goldsmiths and assayers divide the troy pound, ounce, or any other weight, into 24 parts, and call each a C., as a means of stating the proportion of pure gold contained in any alloy of gold with other metals. Thus, the gold of British coinage and of wedding-rings, which contains $\frac{22}{24}$ of pure gold, is called '22 carats fine,' or 22 C. gold. The lower standard used for watch-cases, etc., which contains $\frac{18}{24}$ of pure gold, is called 18 C., and so on. The C. used in this sense has therefore no absolute weight; it merely denotes a ratio. This, however, is not the case with the C. used for weighing diamonds, which has a fixed weight, equal to $3\frac{1}{4}$ troy grains, and is divided into quarters, or 'C. grains,' eighths, sixteenths, thirty-seconds, and sixty-fourths. These C. grains are thus less than troy grains, and therefore the jeweler has to keep a separate set of diamond weights. Even the C. with fixed weight varies in various countries—from about 216 milligrams in Leghorn to 195 in Florence. In England, it is 205.4090 milligrams; in France, 205.5000.

CARAUSIUS, *ka-rav'zŭ-us*, Emperor of Britain: d. 293 or 294. He was a Menapian, i.e., member of a confederation about the mouth of the Rhine; became 'count of the Saxon shore and admiral of the northern seas,' and under the names of Marcus Aurelius Valerius C. was apparently recognized as a third Augustus by Diocletian and Maximian. The natives of Britain invited him, 286, to the sovereignty of that island, which he delivered from the depredations of Saxons and Frank pirates. He reigned for seven years there and in the Low Countries, destroyed two Roman fleets, chased the Picts and Scots into the highlands, rebuilt the wall of Severus, erected on the Carron a trophy which stood until the 18th c., established at Stourbridge a fair which still exists, and connected the Humber and Peterborough rivers by a dike or canal which drained the Lincolnshire fens. His history is gathered largely from coins, designed with ability unusual in that age by artists whom he invited to Britain. He was assassinated at York by his minister Allectus. Monographs upon C. have been written by Dr. Wm. Stukeley (1757), Guenebrier, and J. Watts De Peyster (1858-9); the latter places him among the greatest monarchs who have honored the British crown. He ranks high in the list of brilliant and beneficent 'usurpers,' so called at Rome.

CARAVACA, *kā-rā-vā'ká*: town of Spain, province of Murcia, about 39 m. n.w. of the city of that name, on the slope of a hill crowned with a fine old castle. It has a fine church, with a reputed miracle-working cross; also manufactures of linen and woolen fabrics, soap, paper, leather, etc. Pop. (1887) 15,053.

CARAVAGGIO, *ka-rā-vād'jō*: town of n. Italy, province of Bergamo, about 24 m. e. of Milan. In the principal church are some esteemed paintings by Campi; and C. is noted as the birthplace of the painters, Polidoro Caldara

and Michael Angelo Merighi, both surnamed Caravaggio. In the neighborhood is a sanctuary of the Madonna, built from designs of Pellegrini (1575). Pop. abt. 7,000.

CARAVAGGIO, MICHAEL ANGELO AMERIGHI or MERIGHI DA: 1569-1609; b. Caravaggio, in Lombardy, n. Italy: Italian painter. His father, a mason, employed him in making paste for the fresco-painters, and in this way the artistic genius of the boy was stirred. After studying the works of the great masters in Milan and Venice he went to Rome, where he lived in poverty. At length a picture of his attracted the notice of Cardinal del Monte, who patronized the young artist, but the ferocious and quarrelsome character of C. soon involved him in difficulties. Having fled from Rome to Malta, on account of manslaughter, he obtained the favor of the grand-master by painting an altarpiece in the church of St. John, and other pictures. His quarrelsome nature soon forced him to flee from Malta; and in making his way back to Rome he was wounded, lost all his baggage, caught a violent fever, and on reaching Porto Ercole, lay down on a bank and died, at the age of 40. Trueness to nature was the object aimed at by C., who left all schools and devoted himself to paint life as he found it in lanes, alleys, and other resorts of the lower classes. He studied no such matters as refined sentiment or elevation of realities, but gave in his paintings expression to his own wild and gloomy character. One of his best paintings, *The Fraudulent Gamblers*, is preserved in the Sciarra Gallery, at Rome. His shadows are deep, his backgrounds very obscure; in consequence of which the whole picture seems to possess a mysterious greatness, that is very imposing. Even Rubens confessed that C. was his superior in *chiaro-oscuro*. When he painted sacred subjects he remained falsely faithful to the low realities of Italian life, so that several of his pictures painted for churches had to be removed from their places, because they could not be harmonized with sacred associations. Kugler, the German critic, has justly said of one of C.'s most celebrated works, a *Burial of Christ*, that it appears 'like nothing better than the funeral of a gypsy-chieftain.'

An earlier Italian painter of less eminence, POLIDORO CALDARA DA CARAVAGGIO, was born 1495, and murdered 1543.

CARAVAN, n. *kār'ă-văn'* [F. *caravane*, formerly a convoy of soldiers for the protection of a company of merchants on a trading journey—from Sp. *caravana*: Pers. *kerwan*: Ar. *qairawan*]; a large, close carriage; in the East, a company, commonly merchants, journeying together for mutual safety. Caravans are often composed of great assemblages of travellers which, at stated times, traverse the deserts of Asia and Africa. A C. sometimes has more than 1,000 camels, which follow each other in single file, so that it may be a mile or more in length. The most celebrated caravans are those formed by pilgrims going to Mecca, particularly those which annually assemble at Cairo and at Damascus. The latter consists of 30,000 to 50,000

CARAVANCES—CARAVEL.

pilgrims, and is under the special protection of the Turkish sultan. The caravan by which the Persians travel to Mecca starts from Bagdad, and is the vehicle of a very important trade. The great Indian caravan to Mecca, which started from Muscat, has been long given up. Mecca, upon the arrival of the caravans, bringing goods from so many different parts of the world, presents all the appearance of a vast fair. The trade between Tripoli and the interior of Africa is carried on exclusively by caravans; likewise that between Darfur and Egypt. The great trade between Russia and China is also a caravan trade. In the East, caravans in which the camels have a load of 500 or 600 pounds are called *heavy* caravans; *light* caravans are those in which the camels have only half that weight, so that the daily journeys may be longer. *Heavy* caravans travel from 17 to 18 m. a day; *light*, from 22 to 25. The caravans are generally conducted with great regularity, and assemble at and start from stated places on stated days. The leader of the Mecca-caravans is called Emir-el-Hadsch, i.e., Prince of the Pilgrims. In trade-caravans, a leader called Karwan-Baschi, is elected by the merchants from their own number.

Among the knights of Malta, caravans meant the troops of knights appointed by the order to serve in garrisons, and also the cruises of their galleys against the Turks.

CARAVANCES: see CHICK PEA.

CARAVANSARY, n. *kār'a-vān'sē-rī*, or CARAVAN'SERA, *-sē-ra*, or CARAVAN'SERAI, *-sē-rī* [*caravan*, and Pers. *sarai*, a large place], also KHAN: in the East, a sort of unfurnished inn to provide travellers with shelter. Those in towns and cities, which are generally built for traders, with a small sum charged for a day's sojourn, are handsomer and more convenient—having doors to the apartments—than those on the roads or outside the cities. They commonly consist of a square building of four wings built round a courtyard, in which the beasts of burden may be inclosed, and where there is usually a well of water; the lodgings are small rooms, about 7 or 8 ft. high, which surround the courtyard, and are bare of every article of furniture.

These caravansaries are an institution of very ancient date, being the 'inns' of Gen. xlii. 27, xliii. 21; and it was in the stable of such a place, there being no room for his parents in the lodging apartments, that Christ was born (Luke ii. 7). They belong either to government, to some private individual, or are the property of the church (mosques); those in towns or cities require payment from travellers, but not more than two or three Turkish piastres a day; those on the road are usually free. There are some large and very handsome caravansaries at Cairo, Damascus, Beyrout, Aleppo, etc. The steward or keeper of a C. is called a *caravanseraskier*.

CARAVEL, n. *kār'ā-vēl*, or CARVEL, *kār'vēl* [F. *caravelle*—from It. *caravela*, a kind of ship: Gael. *carbħ*, a ship]: a small French herring-vessel; a light vessel formerly used by Spaniards and Portuguese: see CARVEL.

CARAWAY.

CARAWAY, n. *kār'ā-wā* [Ar. *karwiya*-a, caraway-seeds: F. and It. *carvi*—said to be from *Caria* in Asia Minor: but rather Gr. *karon*; L. *carēum*, the caraway; *Carum carūi*, the plant], (*Carum carui*): plant of the nat. ord. *Umbelliferæ*, growing abundantly in meadows and rich pastures in the middle and s. of Europe, and in parts of Asia, naturalized and cultivated in other countries also, for its aromatic seeds—in botanical language, *carpels*—which are used medicinally as a carminative and tonic; and are also much used as an aromatic condiment, and by confectioners, distillers, and perfumers. They depend for their aromatic properties on the volatile oil of C., obtained by bruising C. seeds, and distilling them with water. It is at first limpid and colorless, but becomes yellow, and subsequently brown by keeping. Oil of C. is used medicinally to relieve flatulence, and to correct the nauseating and griping ten-



Caraway.

dencies of some cathartic medicines; also in the preparation of *Spirit of C.*, and *C. Water*.—*Spirit of C.*, which may be prepared either by dissolving the oil of C. in proof-spirit, or by distilling bruised C. seeds together with proof-spirit, is much used in Russia and Germany as a liqueur (*Kümmel-branntwein*), sweetened with sugar.—C. has a branching stem 1-2 ft. high, with finely divided leaves, and dense umbels of whitish flowers. The fruit is oblong, each carpel having five thread-like ribs, with a single *vitta* (see *UMBELLIFERÆ*) in each of the interstices. The white carrot-shaped root of C. is sometimes used like carrots or parsnips, but has a very strong flavor.—C. has a great enemy in the CARAWAY MOTH (*Hemylis Daucella*), the larva of which destroys both its stem and flowers.

CARBAMIC—CARBINEERS.

CARBAMIC, a. *kâr-băm'ík* [made up from *carbon* and *ammonia*]: denoting a monobasic acid, resulting from the action of ammonia on carbonic anhydrite. **CARBAMIDE**, n. *kâr'bă-mîd*, another term for *urea*.

CARBAZOTIC, a. *kâr'bă-zôt'ík* [*carbon*, and *azote*]: applied to an acid which consists of carbon, nitrogen, and oxygen. **CARBAZOTIC ACID**, or **PIC'RIC ACID**, of great importance in dyeing, is obtained by the action of strong nitric acid and heat on many complex organic materials, such as silk, indigo, salicine and a variety of resins. On a commercial scale it is obtained best from the oil of tar, which distils over from crude tar at between 300° and 400°, or from the resin of *Xanthorrhœa hastilis*. The hot nitric acid solution is strained from impurities, and on cooling, yellow crystals separate of C. acid, which can be purified by washing with cold water. These crystals are readily soluble in alcohol and ether, and dissolve in 80 or 90 times their weight of cold water, yielding a yellow solution, which has a very bitter taste, and stains the skin yellow; and when silk which has been treated with a mordant of alum, or cream of tartar, is immersed in a solution of C. acid, it is dyed of a beautiful permanent yellow color. The bitter taste of C. A. has led to its being fraudulently employed, instead of hops, in communicating a bitter taste to beer.

CARBIDES, *kâr'bîdz*, formerly termed **CARBURETS**, *kâr'bu-rêts*: compounds of carbon with metal. They do not occur in a natural state.

CAR'BINE [see **CARABINE**]: light kind of musket, named probably from the Carabins (see **CARBINEERS**.) It is now used in Britain by the cavalry, the yeomanry cavalry, the Irish constabulary, and other corps. The best carbines are now rifled. A considerable number of American carbines, rifled and breech-loading were purchased at a high price by the English government 1856. This American C. has a barrel only 22 inches in length, and a total weight of 7½ lbs. It is simple in construction, has a great range, hits a mark with accuracy, may be fired with rapidity, requires little cleaning, can be loaded without a ramrod, and supplies itself with caps from a reservoir in the hammer. The Victoria cavalry C. has a barrel 26 inches long; with 0.733 inch bore; its weight is 7½ lbs., and it is fired with 2½ drams of powder.

CARBINEERS, or **CARABINEERS**: light cavalry, said to have derived their designation from the Arabs, among whom the *Carabins* or *Karabins* were light horsemen, stationed at outposts to harass the enemy, defend narrow passes, etc.; in action, they took the place of skirmishers. A corps under the same name was raised in France 1560; but the designation has not been much used in that country since the introduction of Hussars and Lancers. In the English army, C. was at one time a frequent designation for cavalry; but now only one regiment, the 6th dragoon guards, is known by this title; and the distinction between them and other cavalry is little more than nominal.

CARBINOL—CARBOHYDROGENS.

CARBINOL, n. *kâr'bîn-ōl* [L. *carbōnem*, coal or carbon; *olĕm*, oil]: methylic alcohol or wood-spirit, a colorless, combustible liquid.

CAR'BO, CNEIUS PAPIRIUS: nephew of Caius Papirius C., the Roman orator. He was a famous general and partisan of Marius; was elected consul B.C. 86; raised troops to oppose the advance of Sulla, and commanded the army against him at Clusium; was consul again after Sulla's return; was defeated at Faventia by Metellus; fled to Africa, and, while a prisoner, was put to death by Pompey's order, B.C. 82.

CARBOHYDRATE, n. *kâr'bō-hī-drūt* [L. *carbōnem*, coal; Gr. *hūdōr*, water]: an organic compound containing carbon, with hydrogen and oxygen, in the proportion in which these two unite to form water, as sugar, starch, etc.

CARBOHYDROGENS, *kâr'bō-hī-drō-jĕnz*, or **HYDROCARBONS**, *hī-drō-kâr'bonz*: series of compounds belonging to organic chemistry, which are composed of carbon and hydrogen, in such proportions that the various members of the group differ from each other in definite and regular numbers of atoms of carbon and hydrogen. The best marked group of hydrocarbons commences with methylene (C_2H_2), which may be regarded as the first step in the ladder, and by the successive addition of other two atoms of carbon and hydrogen, are obtained ethylene or olefiant gas (C_4H_4), propylene (C_6H_6), butylene or oil gas (C_8H_8), amylene ($C_{10}H_{10}$), etc. There are also series beginning with methyl (C_2H_3), then ethyl (C_4H_5), and with hydride of methyl or marsh gas (C_2H_4), then hydride of ethyl (C_4H_6). The members of these groups are likewise characterized by a gradual ascending difference in their chemical and physicial properties, especially the boiling-point, which rises by a given amount.

CARBOLIC ACID.

CARBOLIC ACID, *kâr-bô'ík* [*carbon*, and L. *olĕum*, oil]: a colorless oily liquid obtained from coal-tar—called also *phenol* or *phenylic acid*. CARBOLENE, n. *kâr'bō-lĕn*, a non-volatile hydrocarbon, may be used for increasing the illuminating power of coal gas.

CARBOL'IC ACID, or PHE'NIC ACID, or PHE'NOL (C_6H_5O): the principal acid obtained by distillation of coal-tar. Its strong odor and pungent taste, and many of its other properties resemble those of creasote (q.v.), similarly obtained from wood. It is a powerful poison, especially to low forms of life; and is slightly volatile. Hence it is largely used as an antiseptic (q.v.) and disinfectant (q.v.). It has been supposed, probably erroneously, to be present in normal urine. Its most important application is in Lister's method of dressing wounds. It is used also for rendering inoffensive sewage (q.v.), and for preventing the spread of infectious diseases.

Chemical and Physical Properties.—At ordinary temperatures a solid, in acicular crystals slightly volatile, C. A. becomes at 95° F. an oily liquid, specific gravity, 1.065; boiling point, 370° F. It does not affect a ray of polarized light, as creasote does; does not redden litmus paper; but coagulates albumen. A slip of deal dipped into it, and afterward into hydrochloric acid, and then allowed to dry in the air, acquires a greenish-blue color. With $\frac{1}{9}$ to $\frac{1}{4}$ its own volume of water, or fifteen times that volume or more, a solution is formed at ordinary temperatures; but between these limits a stronger solution separates from a weaker in oil-like globules. It is freely soluble in alcohol, ether, chloroform, glycerine, olive oil, and volatile oils.

Physiological Properties.—In *man*, when applied locally in dilute form, it acts as an irritant; in concentrated form, as a caustic; but it has also an anæsthetic action. When present in the blood in poisonous doses it produces disturbances of the circulation and respiration, insensibility, collapse, and death. Half an ounce has proved fatal. Dangerous symptoms sometimes occur when it is very largely used in surgical dressings, owing to its absorption through wounds or through the skin, the first warning of which is an olive-green or black discoloration of the urine. Its medical uses, dependent on its action on the human tissues, are of comparatively little importance. On *microscopic organisms* which cause putrefaction, etc. (see ANTISEPTICS: GERM THEORY), it acts as a speedy poison. Hence it is used as an inhalation in consumption and other lung-diseases where these are present, as a local application in treating offensive discharges, as a disinfectant in infectious diseases. But its most important use is in the treatment of wounds first practiced by Lister.

Listerism or the Antiseptic Method in Surgery.—The credit due to Lister depends, not on the use of carbolic acid, which had been previously applied to the treatment of wounds by Lemaire, Declat, and others, but on his clear appreciation of the connection between putrefaction in wounds on the one hand, and pyæmia (q.v.), septicæmia, hospital gangrene, etc., on the other, and on his making a systematic attempt to exclude or eradicate the causes of

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putrefaction from wounds. Carbolic acid is not essential to his method; many other antiseptics have been employed in accordance with his principles; e.g., salicylic acid, iodoform, thymol, oil of eucalyptus etc.; but carbolic acid is still, in spite of many disadvantages, the one which has hitherto proved most satisfactory in the hands of the most successful surgeons.

Method of Operating and of Dressing Operation-wounds.—The skin of the part, the hands of the operator and his assistants, and the instruments, are carefully purified with a watery solution (1 in 20) of carbolic acid. Sponges, Ligatures (q.v.), Drainage-tubes (q.v.) are kept in carbolic acid solutions. The operation is conducted in an atmosphere impregnated with carbolic acid by means of a fine spray, produced usually by steam generated in a small boiler. When the operation is completed and the wound closed, it is covered with a layer of specially-prepared oil-silk (protective), to prevent constant irritation by the carbolic acid in the dressing. This consists of muslin impregnated with a mixture of carbolic acid, resin, and paraffine; it retains the carbolic acid at ordinary temperatures, but gives it off slowly at the temperature of the body, so that the dressing remains in an actively antiseptic condition for some days, till all its carbolic acid has evaporated. The first layer is wetted in carbolic acid solution (1 to 40) to destroy any germs adhering to its surface, and render it actively antiseptic at once. The remainder is applied dry, in order to soak up the discharge as it flows from the wound. A layer of waterproof cloth is usually put outside the muslin in order to prevent the discharge from coming to its surface directly. The whole is fixed by bandages. The dressing is in general not changed till discharge becomes visible at its edge. When it is changed, similar precautions with regard to spray, purification of hands, etc., must be observed.

Treatment of Wounds not Inflicted by the Surgeon.—They are washed out with a carbolic acid solution, watery, 1 to 20 if recent; alcoholic, 1 to 5 if of more than 12 or 24 hours' standing. They are then treated like operation-wounds. After 48 hours at farthest, it is not generally possible to eradicate the causes of putrefaction thoroughly.

Results.—If this treatment is thoroughly carried out: (1) no bacteria and no putrid smell are present in the discharge; (2) nopyæmia, septicæmia, hospital gangrene, or erysipelas results; and in general (3) no formation of pus takes place; (4) no pain is felt in the wound; (5) no fever follows.

Some of the most striking effects of this method on surgical practice are: (1) In many cases of injury, especially compound fractures and dislocations, a limb may now be preserved where amputation was formerly considered necessary. (2) Many operations are now fearlessly and safely performed, which formerly were either not attempted, or were frequently followed by disastrous results; especially operations on bones and joints, and opening of chronic abscesses (q.v.), and serous membranes (q.v.). (3) Mortality from injuries and operations has been greatly diminished: e.g., the death-rate after major amputations

(1864 and 1866) fell from 45 per cent. to 15 per cent. (1867-69) in Lister's wards in Glasgow after he introduced his method, and to about 12 per cent. (1871-77) in Edinburgh, when he had farther developed it. Volkmann of Halle was on the point of closing his wards in consequence of the prevalence of pyæmia and septicæmia. He tried Lister's method, and during the next five years the total mortality in his wards was less than 6 per cent. See Cheyne's *Antiseptic Surgery* (Smith, Elder & Co., 1882), for a full discussion of the question.

CARBON, n. *kâr'bôn* [It. *carbone*: F. *charbon* and *carbone*—from L. *carbōnem*, a coal]: pure charcoal; the chemical element known as charcoal, diamond, and graphite—less pure in coal, etc. CARBON'IC, a. -*ik*, or CAR'BONA'CEOUS, a. -*bō-nā'shūs*, containing charcoal; coal. CAR'BONATE, n. -*nāt*, a compound formed by the union of carbonic acid with a base, e.g., carbonates of lime, soda, potash, iron, lead, copper, silver, etc.; they are easily decomposed by heat or by a more powerful acid. CAR'BONATED, a. combined or saturated with carbon. CAR'BONIF'EROUS, a. -*nīf'ér-ūs* [L. *fero*, I carry]: producing carbon or coal; in *geol.*, one of the great palæozoic periods, or systems of stratified rocks. CAR'BONIZE, v. -*nīz*, to change into carbon. CAR'BONI'ZING, imp. CAR'BONIZED, pp. -*nīzd*. CAR'BONIZA'TION, n. -*zū'shūn*, the act or process of carbonizing. CARBONOMETER, *kar-bôn-ōm'ē-tēr* [Gr. *metron*, a measure]: an instrument for detecting the presence of an excess of carbonic acid by its action on lime-water. CARBONIC ACID, a gas composed of one part of carbon and two of oxygen; sometimes restricted to the hypothetical compound of this gas with water. CARBONATE OF LIME, limestone or chalk. CARBONIC ANHYDRITE, a gas forming the second component of chalk, *lime* being the first; same as carbonic acid.

CAR'BON: one of the elementary substances largely diffused in nature. It occurs uncombined in the mineral graphite or black-lead (q.v.), and in the diamond (q.v.) which is pure crystallized carbon. It is much more abundant, however, in a state of combination. United with oxygen, it occurs as carbonic acid (CO_2) (q.v.) in the atmosphere, in natural waters, in limestone, dolomite, and ironstone. In coal it is found combined with hydrogen and oxygen; and in plants and animals it occurs as one of the elements building up wood, starch, gum, sugar, oil, bone (gelatine), and flesh (fibrine). Indeed, there is no other element so characteristic of plant and animal organisms, and it ranks as the only element never absent in substances obtained from the two kingdoms of organic nature. Wood-charcoal, coke, lampblack, and animal charcoal are artificial varieties, more or less impure, of carbon. The atomic weight or equivalent of C. is 6 (new sys. 12); the specific gravity greatly varies; that of the diamond is 3.330 to 3.550 (water being 1.000), and of graphite 1.800. C., in its ordinary forms, is a good conductor of electricity; in the form of diamond it is a non-conductor. Of heat, the lighter varieties of C., such as wood-charcoal, are very bad

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conductors ; graphite in mass has very considerable conducting powers. At ordinary temperatures all the varieties of C. are extremely unalterable ; so much so that it is customary to char the ends of piles of wood which are to be driven into the ground, so as by this coating of non-decaying C. to preserve the interior wood ; and with a similar object the interior of casks and other wooden vessels intended to hold water during sea-voyages, are charred (coated with C.), to keep the wood from passing into decay, and thereby to preserve the water *sweet*. Its power of arresting odors and colors likewise varies much. See BONE-BLACK. In the simple property, even of combustion, there is a marked difference. Wood-charcoal takes fire with the greatest readiness, bone-black less so ; then follow in order of difficulty of combustion—coke, anthracite, lampblack, black-lead, and the diamond. Indeed, black-lead is so non-combustible that crucibles to withstand very high heats for prolonged periods without breakage or burning are made of black-lead ; and the diamond (q.v.) completely resists all ordinary modes of setting fire to it. In the property of hardness C. ranges from the velvet-like lampblack to diamond. Small diamonds have been made artificially by submitting carbon to a great heat and allowing it to crystalize. These experiments have been but partly successful, but have led to the manufacture of CARBORUNDUM (q.v.).

Carbon for Electrical Purposes.—When C. is obtained of sufficient density, it is found to be a good conductor of electricity, and to make an excellent electro-negative element in a galvanic pair. Graphite displays these qualities to advantage, and so does the hard incrustation of C. that is found sublimed in gas retorts. Coke, and wood-charcoal are too porous to possess them to any great extent. The scarcity of graphite, and the precarious supply of retort-C., preclude the possibility of obtaining much practical advantage from the electrical properties of C. with these substances alone. We are indebted, however, to Prof. Bunsen, of Heidelberg, for the discovery of a process whereby a C. of the requisite density can be manufactured with great ease and economy. The carbons thus obtained for galvanic batteries rival platinum in electric energy, and they have aided in no small degree, from their cheapness, in heightening the utility of galvanic electricity. The Bunsen carbons, as manufactured in Germany, are of the form of hollow cylinders, whereas those made in France and England are solid rectangular prisms. The following are the more important details of the process. Two parts of coke and one of baking coal—the proportion varying to some extent with the materials—are ground to a fine powder and passed through a sieve. The powder so got is transferred to iron-plate molds of the required shape, the seams of which are merely clasped together, and luted with clay. No pressure is employed in filling them, other than that of shaking. When the molds are filled, they are placed in a furnace, and kept there till all carburetted hydrogen has escaped from them. They are then taken out and allowed to cool before the mass within is removed which is now found to have taken a solid

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form, and to be so hard that it may be turned or ground to the exact size wanted. At this stage, the carbons are destitute of electrical action, and they must consequently be rendered more dense by a subsequent process. This consists in soaking them thoroughly in thick sirup, or, better still, in gas-tar thickened by boiling, and laying them aside till dry, after which they are packed with charcoal-dust in fire-proof crucibles, and exposed for a considerable time to a high heat. If one soaking and charring is not enough, the same may be repeated until sufficient density is obtained. Throughout the process, it is essential that all flaming matters be driven off, so as to leave only the C. in the mold; and care must be taken that no air be admitted to the mold when under the action of heat; otherwise there would be a loss of C. from combustion. The manufacture of these carbons may be carried on contemporaneously with that of gas. The sticks of C. used for the electric light are obtained by sawing up either C. made by this process or the C. of the gas retorts. Chemically pure graphite is produced by decomposing these carbon sticks in an electric furnace, and after considerable experimenting with various carbonaceous substances it has been found that graphite may be produced directly from anthracite coal by electric decomposition. This process is carried on extensively at Niagara Falls, N. Y.

CARBONARI, *kâr-bo-nâ'rî* or *kâr-bô-nâ'rê* [*literally*, 'colliers' or 'charcoal-burners']: secret political society, first, in some degree, made known in 1820. The constitution, like the precise objects of the C., still remains in a great measure secret; though they have printed instructions, catechisms, statutes, rituals, etc., for their associates. The statements respecting the high antiquity of this secret confederacy are fabulous. There is every reason to believe that it originated during the last French *régime* in Naples. Botta, in his *Storia d'Italia*, states that, under Murat's government, the Neapolitan republicans, equally hating the French and King Ferdinand, escaped into the wild defiles of the Abruzzi, and here, naming themselves 'C.,' formed a secret society. It is said that their leader, Capobianco, had great powers of popular eloquence, and that their motto or war-cry was, 'Vengeance for the lamb torn by the wolf!'

The peculiar phraseology of the C. is taken from the vocation of charcoal-burners. For instance, they are (or were) wont to speak of 'clearing the forest of wolves.' The 'wolves' probably meant, at first, foreign tyrants; but in the course of time, after the restoration of the Neapolitan Bourbons, such symbolical expressions had reference to *their* despicable misrule. Among themselves the initiated were styled 'good cousins.' The various societies do not seem to have had a common centre, or to have been properly organized for combined action. A place of meeting was styled 'a hut' (*baracca*); the external neighborhood, 'the forest;' and the interior of the hut was the *vendita* or 'place for selling coal.' A union of several of these huts formed a 'republic.' The superior huts (*alte*

CARBONATED WATERS.

vendite) at Naples and Salerno endeavored, but without success, to effect a centralization of the C. The soc., soon after its institution, numbered 24,000—30,000 adherents, and increased so rapidly in Italy that, in 1820, March, it is said as many as 650,000 new members were initiated, including considerable numbers of the military and the clergy. The religious and Protestant character of the order is expressed in its statutes, which include the article: 'That every Carbonaro has the natural and unalterable right of worshipping God according to his own convictions.' Though Carbonarism did not arise from the lodges of freemasons (as several have supposed), it has borrowed many forms of masonry.

After the restoration of the Bourbons, several secret political unions were formed in France, and in 1820 were confederated with the Carbonari. Paris after the prosecutions against the secret societies of Italy, was made the headquarters of a Carbonarism, which, adopting all the symbolic phraseology, rules, and regulations of the Italian societies, received from the rapidly systematizing genius of the French, an organic character which it had never had before. The initiated styled themselves *bons cousins*, and spoke of the uninitiated as *pagani* (heathens). Written documents and communications were strictly prohibited by the heads of the union, and treachery was to be punished by assassination. After the close of the French and Spanish war, the C., whose activity in contriving plots had excited the terror of the French prefects, restricted its endeavor to the circulation of republican ideas, without direct attempts toward insurrection. After the July revolution several of the leading French C. attached themselves to the new *régime*, and their society was gradually dissolved. In its place the new *Charbonnerie Démocratique* was founded, having for its object the establishment of a republican government, founded on the principles of Babeuf (q.v.). The endeavor of these new C. to make Paris the centre of all political movements, led to the secession of the Italian refugees, who associated themselves under the title 'Young Italy.' French Carbonarism is not *known* to exist at present, and it is possible that even in Italy the triumphs of constitutional patriotism during recent times have rendered its existence no longer necessary, but it certainly was alive at the commencement of the Franco-Sardinian war with Austria; and one of the rumors of the time was, that the French emperor—who, in his young republican days, had been a member of this society—had entered on the war of liberation, to conciliate his old associates, who had menaced him with the fate of a traitor.

CARBONATED, or ACIDULOUS, WATERS: those which contain great excess of carbonic acid gas. The amount of gas in ordinary spring and well waters does not amount to more than 3–8 cub. in. in 100 cub. in. of the water; but in waters entitled to be called C., the proportion of gas to 100 cub. in. of water rises to 30–60, when they are considered rich; 100–200, when they are very rich; and in the waters of St. Nectaire it is said that the proportion

CARBONDALE—CARBONIC ACID.

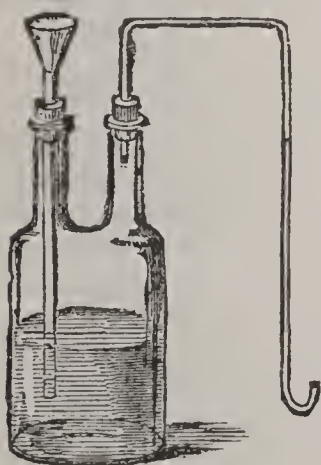
of gas is as high as 400 volumes to 100 of the water. These waters sparkle much when poured from one vessel to another. The carbonic acid is free, but is generally accompanied (1) by bi-carbonate of soda, when the water is called *carbonated-alkaline* or *acidulo-alkaline*, as in the Seltzer, Pymont, Salzbrunn, Altwasser, and Reinerz acidulous mineral springs; or (2) by carbonate of iron, when the water is named *carbonated* or *acidulous chalybeate*: see CHALYBEATE WATERS. The C. or A.W. are very refreshing and exhilarating, and are useful in certain disordered states of the stomach; they relieve nausea, and generally increase the discharge of liquid from the system. They are objectionable in the case of persons of a full and inflammatory state of body.

CARBONDALE, *kâr'bon-dāl*: city of Lackawanna co. (formerly in Luzerne co.), Penn.; incorporated 1851; on the Delaware and Hudson railroad, 17 m. n.e. of Scranton. A branch of the New York Lake Erie and Western railroad connects it with the Erie railroad at Susquehanna Junction. It is at the head of the Lackawanna valley, which is rich in anthracite; the Delaware and Hudson Canal Co. works the mines, obtaining about 900,000 tons annually. The coal is drawn up inclined planes, carried by railway to Honesdale, and thence to the Hudson river by canal. C. has 4 wards, 9 churches, 2 banks, and 2 newspapers. Pop. (1870) 6,393; (1880) 7,714; (1890) 10,833; (1900) 13,536.

CARBON DISULPHIDE, *dī-sŭl'fīd*, or **BISULPHIDE**, *bī-sŭl'fīd*: colorless liquid produced by burning carbon in an atmosphere of sulphur, or by distilling certain of the metallic sulphides with charcoal; specific gravity 1.268. C. D. is of great use in a large variety of manufacturing processes.

CARBONIC ACID, or **FIXED AIR**, or **CHOKEDAMP**: a substance occurring free as a gas in the atmosphere, to the extent of 1 volume to 2,500 of air, and also in combination with a variety of substances. It is most easily prepared for experimental purposes from chips of marble, water and hydrochloric acid, which are placed in a gas bottle with tubes (see fig.). The hydrochloric acid (HCl) acts on the marble (CaO , CO_2), and forms chloride of calcium (CaCl), water (HO), and carbonic acid (CO_2), which escapes as gas with effervescence, and may be conducted by a proper tube under the mouths of jars filled with water and placed on a pneumatic trough. Where C. A. is required in large quantities, it is prepared in a leaden vessel from chalk (CaO , CO_2) and sulphuric acid (SO_3) diluted with water, when sulphate of lime (CaO , SO_3) is formed, and C. A. escapes as gas.

The atomic weight or equivalent of C. A. is 44, it is a clear, colorless gas, with a pleasant, acidulous smell and taste. Under great pressure and cold, it can be condensed



into a liquid, and even a solid resembling snow in appearance. Under ordinary atmospheric pressure, C. A. dissolves in water to the extent of 2 volumes of gas in 3 of water; but under increased pressure, a very much larger amount of gas is taken up by the water, and in this way the various kinds of aerated waters (q.v.) are prepared. The gas is more than half as heavy again as ordinary air, being 1529. It is incombustible, and a non-supporter of combustion, at once extinguishing a lighted candle, gas jet, or even a piece of burning phosphorus, when these are placed in a jar filled with the gas, or even in a mixture of C. A. and air. This power of putting out flame and fire has been turned to account in the extinguishing of burning coal-mines, where, all the openings to the mine being properly secured, C. A. in the form of the spent air from an ordinary coal-furnace, has been passed into the mine, with the result of successfully stopping the fire. It is irrespirable in a concentrated form, producing spasm of the glottis, which prevents the admission of the gas into the system; and when mixed with air it can be breathed without suspicion, and then acts as a narcotic poison, even when present only to the extent of 4 or 5 per cent. of the air. The deadly effects of C. A. are observed in the combustion of charcoal, coal, or *coal-gas*, in chauffers, furnaces, or in fire-places with the dampers down, when the deadly fumes of C. A. steal more or less quickly over the inmates of the room, and they almost unconsciously become its victims—thus unknowingly following the course of the Parisian suicide, who purposely lights a charcoal fire in the centre of his room, and awaits death; and in overcrowded rooms where the C. A., exhaled from the lungs of each inmate at every breath, poisons the air of the apartment, and day by day slowly but surely robs the robust of health, and ultimately of life. In such cases as the Black Hole of Calcutta (q.v.), where there was scarcely any outlet for the poisonous gas, only a few hours may be required to complete the catastrophe.

Though poisonous when inhaled by the lungs, C. A. is rather refreshing when taken into the stomach. Thus, aerated beverages of all kinds—beer, champagne, and carbonated mineral waters—owe their refreshing and invigorating qualities to the presence of C. A., and if the gas be allowed to escape they become stale and almost tasteless.

Besides being present everywhere in the atmosphere in the proportion of 1 to 2,500, C. A. is largely evolved from fissures in the earth, especially in volcanic districts. In the *poison* or *Upas valley* of Java, a valley of an oval form, about three-quarters of a mile in circumference, and 30 to 35 ft. deep, the carbonic acid rises to a height of about 18 ft. from the surface, and the whole bottom of the valley is devoid of vegetable and animal life, and is strewn here and there with the bleached bones of man and other animals that have unluckily stepped within the deadly circle. A dog thrown in, dies in 14 seconds; and birds attempting to fly across the valley, instantly drop down dead. In the neighborhood of the lake of Laach, in Rhenish Prussia, the amount

CARBONIC OXIDE.

of C. A. evolved every day has been estimated at 600,000 lbs. weight. In a state of combination C. A. forms an ingredient in a great number of minerals called *carbonates*, such as chalk, limestone of various kinds (CaO, CO_2), black-band, iron-stone (carbonate of iron, FeO, CO_2), malachite (carbonate of copper, $\text{CuO}, \text{HO}, + \text{CuO}, \text{CO}_2$), etc. C. A. is the principal product of combustion; the carbon of the burning substance (coal, candle, coal-gas, wood, paper, etc.), uniting with the oxygen of the atmosphere, and forming C. A. (CO_2). It is also a product of respiration (q.v.), and is evolved more or less largely by all animals, not only by the mouth, but in exhalations from the skin, and is present in blood, urine, etc. It is evolved during the fermentation (q.v.) of beer, wine, etc., and often remains in brewers' vats when the liquor has been drawn off. During the decay of vegetable and animal matters, C. A. is produced, and in explosions of fire-damp in coal mines, it is formed in large quantity, and fills the underground passages.

C. A. forms the largest ingredient in the food of vegetables, and is therefore abstracted in large quantity from the air by plants. It enters into combination with the majority of the oxides of the metals and other compounds, to form a class of salts called *carbonates*, several of which have been referred to. C. A. when present in a vessel in quantity may be recognized by the power of extinguishing a lighted candle, or by not burning itself. C. A. in the form of gas may be readily recognized in the atmosphere by exposing a little lime-water in a saucer, or other shallow vessel, when the lime (CaO) abstracting the C. A. (CO_2) from the air, a white film of carbonate of lime or chalk (CaO, CO_2) is formed on the surface of the liquid. A solution of Baryta (q.v.) in water is more delicate in its action on the C. A. of the air, and more readily indicates its presence.

CARBONIC OXIDE: compound of one atom of carbon and one atom of oxygen; represented by the symbol CO , atomic weight 16. It does not occur naturally, but may be observed burning with a pale-blue flame in fire-places and stoves, especially in frosty weather. During the combustion of the fuel at the lower part of the grate, the oxygen of the air unites with the carbon of the fuel to form carbonic acid (CO_2); and this gas rising up through red-hot coal or carbon (C), has part of its oxygen abstracted by the carbon, and two atoms of carbonic oxide (CO) are produced, which taking fire on the top of the coals, burn with the characteristic blue flame, abstracting more oxygen from the air, and reforming carbonic acid (CO_2). C. O. can be prepared for experimental purposes by heating a mixture of oxalic acid ($\text{HO}, \text{C}_2\text{O}_3$) and sulphuric acid (SO_3) in a retort, when the latter abstracts the water from the oxalic acid, and the other elements (C_2O_3) escape as carbonic acid (CO_2), and C. O. (CO). On passing the mixed gases through a solution of potash (KO), the carbonic acid is retained as carbonate of potash (KOCO_2),

CARBONIFEROUS SYSTEM.

while the C. O. remains as gas. C. O. is a transparent, colorless gas, a little lighter than air, being 967, and has never been liquefied nor solidified. It burns with a blue flame, but is a non-supporter of combustion, and at once extinguishes a lighted candle introduced into it. It is very poisonous, and even when largely diluted with air, if inhaled, it produces a sensation of oppression and tightness of the head, and ultimately acts as a narcotic poison. It does not take part in any natural phenomena, nor is it put to any use in the arts and manufactures, and in these respects affords a striking contrast to carbonic acid, which has so many duties to perform in nature and in the arts.

CARBONIFEROUS LIMESTONE: see **MOUNTAIN LIMESTONE:** also **CARBONIFEROUS SYSTEM.**

CARBONIFEROUS SYSTEM, in Geology: the strata which, in geological order, rest upon the Devonian measures, and are capped by the Permian series. They derive their designation from the amount of carbon contained in them, for to them the great coal-fields of the world belong. In an economic sense they are the most valuable series of rocks in the earth's crust, forming the great storehouse from which is obtained the chief supply of coal, iron, and lime.

The rocks of the system are composed of a vast series of beds of sandstone, limestone, shale, and coal. In some coal-fields these are so interstratified, that it is impossible to subdivide the strata in the order of time. In the Edinburgh district, there are nearly 100 coal-seams, omitting all under 6 inches in thickness. Out of the whole depth of the strata, amounting to about 6,300 ft., these seams occupy only 204 ft. The remainder consists of sandstone and shale in the upper half; toward the middle, limestones appear, and these increase downward in the number and thickness of the beds, but are still intermixed with seams of coal. The same arrangement exists in the other coal-fields of Scotland, as well as of the n. of England. In other districts the limestone is confined to the lower portion of the measures, and separated from the coal-bearing strata, so as to form a natural subdivision of the system into—1. *The Coal Measures*, consisting of shale, sandstone, and grit, with occasional seams of coal; and 2. *The Mountain or Carboniferous Limestone*, a calcareous rock, containing marine shells and corals, and devoid of coal. A coarse quartzose sandstone, passing into conglomerate, is occasionally developed to a considerable extent between these two divisions. This is a local deposit, being almost confined to England, and may be considered as one of the coal sandstones, of coarser texture than usual. Being occasionally used for millstones, it is called *Millstone grit*. It is accompanied with shales containing the usual coal plants, but generally without any true coal seams. Another locally-developed series of beds, consisting of indurated shales, sandstones, and grits, occurs below the carboniferous limestone in s. Wales and Ireland, and is known as the *Lower Limestone Shales*. These rest conformably on a series of yellow sandstones, which

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have been generally referred to the Devonian measures, but which, from their organic contents, as well as from their stratigraphical position, seem to be basement beds of the carboniferous series. The existence and development of these various beds in the United Kingdom will be better understood by an examination of the following table. The maximum thickness of the beds is given in feet when known; the blanks show the absence of the division from the particular coal-field:

	Edinburgh.	Glasgow.	No. York.	Derby.
Coal Measures	6,300	2,800	2,000	2,700
Millstone Grit . . . .	....	....	400	1,600
Mountain Limestone . . . .	....	....	1,659	1,000

	S. Wales.	Kerry.	Clare.	N. Ireland.
Coal Measures	12,000	2,000	2,000	2,200
Millstone Grit	1,000	....	....	1,800
Mountain Limestone	1,500	1,500	3,000	6,400
Lower Limestone Shales	500	4,650	150	1,200
Yellow Sandstone . . . . .	.....	3,000	unknown depth	2,000

In the midland counties of England the coal measures are the only portion of the carboniferous system present, and these rest on the Silurian or older rocks. In Devonshire occurs an extensive series of shales and sandstones, with a few beds of earthy anthracite or culm, associated with argillaceous rocks, probably belonging to the lower limestone shales, much indurated, and traversed by slaty cleavage.

From the great economic value of the contents of the C. S., we are better acquainted with its fossils than with any fauna or flora that flourished before the tertiary epoch. As coal is the result of the mineralization of vegetable matter, the coal measures must necessarily abound in the remains of plants. No less than 294 species have been described as found in Britain alone. Numerous impressions of plants, as well as traces of structure, are found in the seams of coal themselves; but the more distinct forms are preserved in the interstratified beds of mud and ironstone, often in great number and exquisite beauty. Such remains consist chiefly of impressions of leaves separated from their branches; of casts of trunks, more or less broken; and of roots much compressed, yet occupying their original position in the clay soil now indurated into shale; with these occur pieces of wood, or remains of trees, in which the vegetable texture is to some extent preserved. The great proportion of the plants seem to have flourished in marshes, and to have accumulated where they grew, like peat, the material afterward converted into coal. Hence a stratum of shale, in which are inbedded the roots of sigillaria, calamites, etc., is the invariable *floor* on which the coal seam rests. The chief coal plants are lepidodendron (q.v.), sigillaria (q.v.), calamites (q.v.), trigonocarpon (q.v.), and ferns (q.v.) The existence of cone-bearing trees during this epoch, has been proved from the microscopic examination of prepared sections of fossil woods in which the small discs occur that are characteristic of and peculiar to the coniferæ.

CARBON PRINTING—CARBUNCLE.

The animal remains are as numerous and as well preserved as the vegetable. They are found chiefly in the limestone; the greater part, indeed, of this rock, is made up bodily of corals and crinoids. No other such accumulation for extent and variety is known; it has its nearest parallel in the somewhat similar formation now going on in the Southern archipelago. The corals and crinoids were specifically as well as individually numerous. The terebratulæ and other allied forms of bivalve shells, though belonging to a comparatively limited number of genera, were very abundant. The more highly developed mollusca also were numerous; they belonged to a great number of generic types. But the most remarkable group was the fishes. At no period were they more abundant. They belonged to the Ganoid and Placoid groups of Agassiz. The ganoids, having their entire surface covered with scales, were numerous; some of them inhabited shallow water near the shore, and fed on crustaceans and shell-fish, for crushing which they had a formidable apparatus of conical teeth of a very complicated structure. Others were inhabitants of deep water, and were more powerful and predaceous, and more rapid in their movements. Their jaws were produced into a long snout, like the crocodile of the Ganges, and armed with a double series of enormous teeth, which were sometimes as much as four inches long by two inches broad, as in *Megalichthys* (q.v.), dimensions rarely attained even by the largest known reptiles. Associated with these were a great number of sharks belonging to the Cestraciontidæ (q.v.), a family of which there is only a single living representative. They were furnished with a long bony spine to strengthen the dorsal fin, and thus enable them to turn speedily in the water, as they required to do in seizing their prey. These spines are often found fossil. The only remains referred to a higher division of the animal kingdom yet found belong to the saurian *Archegosaurus* (q.v.)

The C. S. underlies large portions of Penn., Ohio, Ill., Kans., Va., and other states. The total known area of this system which may be deemed productive of coal, throughout the world, is estimated at 400,000 sq. m. See ANTHRACITE: COAL.

CARBON PRINTING: see POSITIVE PRINTING.

CARBO-VEGETABILIS, n. *kâr'bō-věj'č-tăb'îl-îs* [L. *carbo*, coal; and new L. *vegetab'îlis*, vegetable]: a name for charcoal.

CARBOXYL, n. *kâr-bōks'îl* [L. *carbōnēm*, carbon; Gr. *ulē*, matter of which a thing is made]: the supposed radical of the organic acids; also called *oxatyl*.

CARBOY, n. *kâr'boy* [Turk. *karaboya*, black dye, copperas or green vitriol; Sicil. *carabba*, a bottle with a big belly and narrow neck]: a large globular bottle, generally covered with basket-work, employed for carrying acids.

CARBUNCLE, n. *kâr būng-kîl* [L. *carbun'culus*, a little coal—from *carbo*, coal]: a red fiery round blotch on the

CARBUNCLE—CARBURETTED HYDROGEN.

skin, like a burning coal; an inflammatory boil; a precious stone of a deep-red color. CAR'BUNCLED, a. *-kld*, set with carbuncles; spotted with red fiery sores. CARBUN'CULAR, a. *-kū-ler*, pertaining to or resembling a carbuncle; red; inflamed. CARBUNCULA'TION, n. *-kū-lā'shūn*, the blasting of the young buds of trees or plants, either by excessive heat or excessive cold.

CAR'BUNCLE: name given by lapidaries to the beautiful mineral called *Pyrope* (q.v.), by mineralogists. The C. of the ancients appears to have been either pyrope, or the deep-red variety of noble garnet (see GARNET), which is in every respect very similar to it; or probably it included both.

CARBUNCLE: an inflammatory boil; named from the two prominent symptoms—a glowing fiery redness, and a burning pain. It consists of an inflammation, caused by some vitiated condition of the blood, or some atmospheric influence, attacking a patch of skin on the shoulders, nape of the neck, or indeed any part of the body. The part swells slightly, feels hard, and this hardness extends deeply into the tissues; the pain is very severe, and the patient much depressed with loss of appetite and general derangement of the secretions. As the disease advances, the redness assumes a dark purple or livid hue, the cuticle rises in blisters and many small specks of matter appear on its surface, which discharge, and leave apertures like those in the rose of a watering-pot; through this a thin viscid fluid escapes, and occasionally a small slough or core of the true skin which has been killed by the disease. Sometimes these apertures meet, forming large openings, and in others the whole patch of skin sloughs and comes away. The disease sometimes assumes a malignant and dangerous form.

The treatment of C. consists in restoring the secreting organs to a healthy condition, the agents for which must depend on the individual case; in supporting the patient's strength by easily-digested food, wine, brandy, and, bark, with nitric acid; relieving pain by opiates, and encouraging suppuration with warm poultices, carrot, turnip, and yeast poultices being favorite applications. To prevent excessive loss of skin, the C. must be divided freely with a knife from one margin of the inflamed patch to the opposite one.

CARBURET, n. *kār'bū-rēt*, or CAR'BIDE, n. *-bīd* [F. *carbure*—from L. *carbo*, a coal]: carbon in combination with some other substance, especially a metal, the result not being an acid: V. to combine some other substance with carbon. CAR'BURET'TING, imp. CAR'BURET'TED, pp.. ADJ. combined with carbon. CAR'BURET'TER, n. *that* which. CAR'BURA'TION, n. *-rā'shūn*, the act of. CARBURETTED HYDROGEN GAS, a compound of carbon and hydrogen, such as common coal-gas.

CARBURETTED HYDROGEN: term in chemistry applied to several compounds of carbon and hydrogen. Thus, light carburetted or mono-carburetted hydrogen (CH_4) is the gaseous compound popularly known as marsh gas and fire-damp, and is the principal constituent of coal-gas: see

CARCAJENTE—CARCASSONNE.

GAS. Heavy carburetted or bi-carburetted hydrogen (C_2H_2) is otherwise known as olefiant gas, which see.

CARCAJENTE, *kâr-kâ-hên'tâ* or *kâr-kâ-hên'tā*: town of Valencia, Spain, about 28 m. s.s.w. of the city of Valencia, on a rich plain near the right bank of the Juncar. It is well built, with good streets, and has a palace belonging to the Marquis of Calzada. It has some manufactures of linen and woolen, and a trade in the agricultural produce of the district. Pop. about 12,000.

CARCAJOU, n. *kâr'ka-jô* [F.]: the American badger (q.v.), *Meles labradorica*, a native of North America; also called the wolverine.

CARCANET, n. *kâr'kă-nět* [F. *carcan*, an iron collar—from OF. *quercant*—from Icel. *querk*, the throat]: a chain or necklace of jewels. Venice was famous for the manufacture of carcanets in the 15th century.

CARCASS, n. *kâr'kăs* [OF. *carquasse*, a dead body; F. *carquois*, a quiver: mod. Gr. *kar'kasi*, a quiver, a carcass: It. *carcasso*, a quiver, the hard core of fruits: Gael. *carcais*, a dead body]: the dead body of an animal; applied to the living body in contempt; the framework or principal parts of a thing unfinished, as a house. CARCASS, or CARCASSE, n. *kâr-kăs'* [F. *carcasse*—from It. *carcassa*, a bomb, a shell]: in *military pyrotechny*, a hollow case of iron, sometimes globular, sometimes ovate, filled with combustibles. It is fired from a mortar. Its chief use is to ignite buildings in the enemy's quarter, and to give sufficient light to aim the shot and shells. Carcasses are said to have been first used by one of the princely ecclesiastics of Germany, the Bishop of Munster, when he fought against the Duke of Luxembourg at Groll, 1672. The oval carcasses, being uncertain in their flight, are now nearly abandoned. The round carcasses now made are chiefly those here indicated:

Diameter.	Composition.	Weight.
13 inch.	18 lbs.	213 lbs.
10 “	7 “	100 “
8 “	3 “	51 “
5 “	19 oz.	17 “
4½ “	7 “	9 “

Carcasses are intended not to burst, but to send out, through holes, a furious and inextinguishable fire, which lasts from 3 to 12 minutes. The composition with which they are filled consists of saltpetre, sulphur, meal gunpowder, pitch, rosin, tallow, and Venice turpentine, about half being saltpetre. The composition is packed in tightly through one of the holes; and the holes are stopped with fuses adjusted to ignite the composition after a certain space of time. Sometimes old pistol barrels, loaded to the muzzle, are introduced with the composition. Compare CASE-SHOT: SHELLS.

CARCASSONNE, *kâr kăs-sünn'*: town in the dept. of Aude, France, on the river Aude, and the *Canal du Midi*, about 55 m. s.e. of Toulouse. It is divided into two parts, the old and new towns. The modern town is well built, with streets at right angles to each other, squares adorned

CARCEL-LAMP—CARD.

with trees, pleasant boulevards, and several marble fountains. The old town, on a height, is much more picturesque, with its ramparts and towers, parts of them dating from the time of the Visigoths, and the rest, with the castle, from the 11th or 12th c. This old town suffered greatly at the hands of the fierce bigot Simon de Montfort and his Crusaders, who here burned 400 of the Albigenses. In the 14th c. it effectually resisted the Black Prince. The cloth manufactures are important, employing, it is said, upward of 7,000 people. C. has manufactures also of paper, leather, linen, and soap. The ancient name of the town was Carcaso, and it was a place of some note in the time of Cæsar.—Pop. (1901), exclusive of garrison, 30,720.

CARCEL LAMP, n. *kâr'sêl-lămp* [from *Carcel*, name of the inventor]: a French lamp in which the oil is raised to the wick by clock-work. It is much used in light-houses.

CARCERULE, n. *kâr'sêr-ûl* [L. *carcer*, a jail]: in bot., a dry, indehiscent, many-celled fruit, with one or two seeds in each cell, the cells cohering round a common style placed in the axis.

CARCHA'RIAS: see **SHARK**.

CARCHARODON, n. *kâr-kăř'ô-dôn* [Gr. *karchar'odon*, having rough or jagged teeth — from *kar'charos*, sharp-pointed; *odon'tês*, teeth]: in geol., a genus of sharks of the Tertiary period, whose fossil teeth, etc., are often of great size.

CARCHEMISH, *kâr'ke-măsh*: city mentioned thrice in Scripture (2 Chron. xxxv. 20; Is. x. 9; Jer. xlv. 2); often, but mistakenly, identified with the classical Circesium. It was much further up the Euphrates, nearly on the site of the later Hierapolis or Mabog. As shown by Assyrian inscriptions, it was B.C. 1100–850, a chief city of the Hittites, then masters of Syria from Damascus to the Euphrates at Bir. As commanding the passage of the river, it was of importance in the wars between Assyria and Egypt. C. appears to have been taken by Pharaoh Necho soon after the battle of Megiddo, abt. B.C. 608, and retaken by Nebuchadnezzar, 605. The word means 'fort of Chemosh,' deity of the Moabites.

CARCINOLOGY, n. *kâr'sîn-ôl'ô-jî* [Gr. *karkin'os*, a crab; *logos*, discourse]: the science that treats of crabs, or the *Crustaceæ*; a treatise on. **CAR'CINOL'OGIST**, n. *-ô-jîst*, one skilled in the history, structure, and habits of the *Crustaceæ*.

CARCINOMA, n. *kâr'sî-nô'mă* [Gr. *karkin'os*, a crab, cancer]: cancer in general; the ulcerative stage of cancer (q.v.). **CAR'CINO'MATOUS**, a. *-nô'mă-tûs*, pertaining to cancer in general.

CARD, n. *kârd* [F. *carte*—from L. *charta*; mid. L. *carta*, paper: It. *carta*]: a piece of pasteboard usually written or printed on for social or business purposes; oblong pieces of pasteboard on which figures are printed, used in games. **CARD-CUTTER**, a machine for reducing card-

CARD—CARDAMOM.

board to pieces of uniform and proper size for cards. **CARD-TABLE**, a table specially adapted for play with cards (see **CARDS**). **CARD-MAKER**, one who. **ON THE CARDS**, publicly made known as likely to take place; said in reference to *events* in horse-racing that are to come off, as being inscribed or written down in proper form; anything likely or possible to happen: on the tapis. **PLAYED HIS CARDS WELL**, has acted wisely and skilfully to attain his ends—*primarily*, referring to successful card-playing. **TO SPEAK BY THE CARD**, to utter only what the speaker is certain about, as if printed on a card.

CARD, n. *kârd*, or **CARDING MACHINE** [F. *carde*, a teasel-frame—from L. *carduus*, a thistle, a teasel—from *Carĕrĕ*, to comb wool: It. *cardo*, a thistle: Gael. *card*, to card wool: Ger. *scharren*, to scrape]: an instrument for combing out wool or flax. **CARD**, v. to comb out wool, flax, or hemp; to separate the finer from the coarser fibres. **CARD'ING**, imp. **CARD'ED**, pp. **CARD'ER**, n. one who. The process of disentangling and arranging in parallel rows the fibres of cotton may be compared to the combing and brushing of one's hair, and the *card* combines the properties of the comb and brush, being a brush with wire teeth instead of bristles. These teeth are inserted in strips of leather fixed upon the surface of a cylinder. Several such cylinders are arranged so that the ends of the teeth are nearly in contact; and the cotton being brought to them, is caught up, passed from one to the other, and as the cylinders revolve is combed out in the form of beautiful films or fleeces, which are removed by a smaller drum-card, called the 'doffer,' and again from this by the 'doffing-knife.' These films, which are of the width of the drum, are next contracted to a narrow ribbon, by being passed through a funnel; and thus narrowed, are called the 'card ends' or 'slivers,' and are now ready for the next process of 'drawing' or 'doubling': see **SPINNING**.

CARDAMINE: see **CRESS**, **BITTER**.

CARDAMOM, n. *kâr'ĭă-mŏm* [F. *cardamome*: L. *cardamomum*]: Indian spice plant of various species, whose seeds or capsules are used in medicine; of the nat. ord. *Scitamineæ* (q.v.), and belonging to at least two genera, *Amomum* and *Elettaria*. Cardamoms are three-celled, and contain numerous wrinkled seeds, which form an aromatic pungent spice, weaker than pepper, with a peculiar but agreeable taste. On account of their cordial and stimulant properties, they are used in medicine, very generally to qualify other medicines; they are used also in confectionery; in Asia they are a favorite condiment; and in the n. of Germany, they are used in almost every household to flavor pastry.—The cardamoms called *True* or *Officinal Cardamoms*, also known in commerce as *Malabar Cardamoms*, are the produce of *Elettaria Cardamomum*, native of the mountains of Malabar and Canara. They depend for their qualities on a peculiar pungent essential oil, called *Oil of Cardamom*, which may be obtained from them by distilling them with water, and, when fresh, is colorless. Other kinds of C. occur in com-

CARDAN—CARDBOARD.

merce, but not equal to the true C. in commercial value. The different kinds of C. differ not only in strength, but in the character of their aroma. The plants producing them have much general similarity.

CARDAN, *kâr'dan*, JEROME: mathematician, naturalist, physician, and philosopher: 1501, Sep. 24—1576, Sep. 2; b. Pavia, Italy; illegitimate son of a physician and jurisconsult at Milan. He received his early education at home, and completed his studies in Pavia and Padua. After some years, he became prof. of mathematics at Milan. Here his reputation began to grow. After a few years, he began to lecture on medicine, to the practice of which he ultimately betook himself. By 1546, his reputation had so increased that he was invited by the king of Denmark to accept a professorship at Copenhagen, which, however, he declined; and in 1552, he went to Scotland, on an invitation from Hamilton, primate of that country. He managed to cure the primate of an inveterate asthma, which had defied the skill of the most celebrated physicians, and returned to Milan enriched by the bounty of his patient. Here he again settled for some time. In the autumn of 1559, however, he removed to Pavia as prof. of medicine, whence, again, in the same capacity, he removed to Bologna, where he continued teaching till 1570, when he was imprisoned for debt. Having regained his liberty in 1571, he went to Rome to avoid his creditors. Here he was speedily admitted a member of the medical college, and pensioned by Pope Gregory XII. The rest of his life he spent, without public employment, in Rome, where he died, a few weeks after finishing his autobiography. Some writers assert, but on no sufficient authority, that he starved himself to death, to fulfil a prediction which he had made as to the time when he should die. It is certain, however, that he was a devoted astrologer, and cast horoscopes for himself and others. The fancifulness necessary to support the faith of an astrologer imbued all his voluminous scientific writings. A summary of his notions on physics and metaphysics is given in his two works—*De Subtilitate*, in 21 books, and *De Rerum Varietate*, in 17 books. On the whole, he wrote 122 treatises on physics, mathematics, astronomy, astrology, rhetoric, history, ethics, dialectics, natural history, music, and medicine. These abound in incoherent paradoxes, contradictions, and capricious abstractions, more than enough to overwhelm the few profound ideas which he originated. A formula for the solution of certain kinds of cubic equations is called 'Cardan's formula,' and was published by him, as his own invention, in the *Ars Magna sive de Regulis Algebraicis* (1545); but it appears that the formula was really the invention of one Tartalea or Tartaglia. In religion C. was heterodox, and commonly reputed an atheist. His numerous writings were collected and edited by Charles Sphon (10 vols., Lyon, 1663).

CARD'BOARD, or CARD: fabric of several layers of paper pasted together. *Bristol-board*, used by artists, is

CARDENAS—CARDIAC.

made entirely of white paper; ordinary C., of fine white paper outside, with one or more sheets of coarse cartridge-paper between. According to the number of layers, they are called *three, four, six, or eight sheet boards*. *Mill-board*, used by book-binders as the basis of book-covers, is made of coarse brown paper, glued and strongly pressed.

The workman arranges the paper in the order required for pasting; and the pile, called a *head* is placed at his left hand, the paste-tub on his right. He lifts a sheet from the head with his left hand, brushes it over with paste with his right; then another is laid upon that and pasted, until he comes to the last required to complete the thickness of one board, when he removes two sheets, and pastes only the upper one, which thus forms the lower sheet of another board. This is repeated till the whole head is pasted, when it is removed to a press, and the water of the paste squeezed out at the edges. The boards are then separated, and dried by hanging them in a room artificially heated. The C., which is now rough and warped, is smoothed and flattened by making a pile consisting alternately of sheets of rough C. and copper plates, with a copper plate at top and bottom. This pile is passed between iron rollers, and the smooth surface of the copper impressed upon the C., which is thus flattened and beautifully polished.

The enamelling of address-cards is produced by brushing over the C. a mixture of *China* or *Kremnitz white* (a fine variety of white lead) and size. After drying, this surface is rubbed lightly over with a piece of flannel, previously dipped in finely-powdered talc; it is then polished by rubbing vigorously with a hard, close-set brush.

CARDENAS, *kâr'dā-nās*: city of Cuba, cap. of the dist. of Cardenas; on a bay of the n. coast, 105 m. e. of Havana. It was founded 1828, and plundered by Gen. Lopez 1850. It has a railroad to Matanzas and Montalvo, and a shallow but commodious port, with good anchorage and a number of long wharves, frequented by several lines of steamers. C. is surrounded by rich sugar plantations, and exports large quantities of sugar, besides molasses and some coffee. It is well laid out, with broad streets lighted by gas, and good buildings. It is called 'the American city,' many of its merchants being from the United States. In its harbor, 1898, May 11, the U. S. gunboat *Wilmington*, revenue cutter *Hudson*, and torpedo-boat *Winslow* engaged Spanish gunboats and shore batteries. The *Winslow* was disabled and Ensign Bagley, with four of her crew, killed. See SPANISH AMERICAN WAR; UNITED STATES. Pop. (two-thirds being white), abt. 11,000.

CARDIA, *kâr'dī-a*: the upper orifice of the stomach, called, on account of its vicinity to the heart, by the same Greek name, *cardia*, and probably hardly distinguished from it in the earliest times of Greek medicine.

CARDIAC, a. *kâr'dī-āk*, or CARDIACAL, a. *-dī-ă-kāl* [Gr. *kardiă*, the heart or the upper orifice of the stomach]: pertaining to the heart; invigorating the heart by stimulants,

CARDIFF.

CAR'DIAC, n. a medicine that excites action in the heart and animates the spirits; cordials, so called from their action on the heart through the stomach. CAR'DIAL'GIA, n. -dī-ăl'jī-ă [Gr. *algos*, pain]: pain in the stomach; heartburn (see INDIGESTION). CARDITIS, n. kâr-dī'tīs, inflammation of the heart. CARDIOMETRY, n. kâr-dī-ôm'ě-trī [Gr. *metron*, a measure]: a measurement of the heart, as by percussion or auscultation.

CAR'DIFF (*Caer-Taff*, Fort of the Taff): parliamentary and municipal borough and seaport, one of the county towns of Glamorgan, s. Wales; on the river Taff, 170 m. w. of London. C., with Cowbridge and Llantrissant, returns one member to parliament. Among the public buildings are the infirmary, town-hall, free library and museum, county jail, law-courts, a lunatic asylum, baths, and a theatre. There is a public park. In six years ending 1881, there had been constructed 145 new streets. Very few of the numerous churches belong to the Church of England. In 1883, it was arranged that C. should be the seat of the new South Wales College.

The port of C. is the outlet for the large mineral and manufactured produce of the central portion of the s. Wales mineral-field, in which are the populous districts of Merthyr-Tydvil, Rhymney, Aberdare, and the Rhondda Valley, with which this port is connected by the Taff Vale, the Rhymney, and the Ely Valley railways, and the Glamorganshire canal. The town is also one of the chief stations on the Great Western line from London to Milford Haven. The Bute docks, e. and w., area 76 acres, constructed at the expense of the Bute estate, have cost upward of a million sterling, and belong entirely to the present marquis. There are about 40 staiths on the quays of the docks, with machinery of a peculiar construction for the purpose of loading vessels with coal, by which the breaking of the coal is almost entirely prevented. Each of these staiths is capable of shipping 560 tons of coal in a day of 12 hours. There is also a tidal harbor, with 7 staiths, each capable of shipping 400 tons of coal per day, and a low-water pier 1,400 ft. in length. Height of water at spring-tide, 31 ft. 8½ inches; at neap-tide, 21 ft. 7½ inches. Width of sea-gates, 55 ft.; length of quays, 11,100 ft.; width of dock, 300 ft. southern and 500 ft. northern part; depth, 25 ft. C. imports include copper ore, live cattle, salted provisions, foreign fruit and vegetables, corn and flour, etc. The Penarth docks, about 3 m. westward, form another outlet for the trade of the district. Steamers ply between the port of C. and New York, London, Liverpool, Glasgow, Bristol, Cork, Whitehaven, etc.

The assizes (half-yearly, alternately with Swansea) and the quarter-sessions are held at the town hall. The ancient city of Llandaff, now a mere village, is almost connected with Cardiff. Cardiff castle, built in the 11th c., is partly in ruins, and partly occupied by the Marquis of Bute, to whom nearly the whole of the modern town belongs. Robert Duke of Normandy, brother of Henry I.,

CARDIFF GIANT—CARDIGANSHIRE.

died in the castle, after being a prisoner 28 years. Cromwell (1648) after bombarding the castle three days got possession of it through the treachery of one of its defenders, whom he afterward hanged as an example to his own soldiery. This town was anciently important, successively under the British, Romans, and Normans. Pop. (1801) 2,000; (1871) 56,911; (1881) 85,378, with floating pop. abt. 5,000; (1888) 130,500; (1891) 128,849.

CARDIFF GIANT, *kâr'dîf*: name given to a rude statue, 10½ ft. high, dug up 1869, Oct. 16, at Cardiff, a small village of Lafayette township, Onondaga co., N. Y., and exhibited for months as a petrification. The persons who thus deluded the public at last confessed that the 'Giant' had been cut from a block of gypsum quarried at Fort Dodge, Io., sculptured at Chicago, conveyed to Cardiff, and there buried and 'accidentally discovered.'

CARDIGAN, *kâr'dē-gan* (anciently *Aberteifi*, Mouth of the Teify): county town of Cardiganshire, s. Wales, municipal borough and seaport, in the s.w. corner of the county, on the right bank of the Teify, 3 m. from its mouth, 239 m. n. by w. of London. The vicinity exhibits romantic scenery on the Teify, and grand rocks on the coast. The streets, except the chief one, are narrow and steep, the houses built of slate-rock. In 1880, 1,635 vessels, of 57,780 tons, entered and cleared the port. The general trade is confined to vessels of 20 to 100 tons. Vessels of 400 tons reach the town by spring-tides. C. became an important town about the time of the Norman conquest. The Normans were frequently defeated before mastering it. There are the remains of a castle on a low cliff on the Teify, supposed to have been founded, 1160, by a Norman baron. The town suffered much in the struggles between the Welsh and the Normans. The Teify is said to have been the last British resort of the beaver.—Pop. municipal borough (1871) 3,461; (1881) 3,633; (1891) 3,669.

CARDIGAN BAY: semicircular bend of St. George's Channel, on the w. coast of Wales, 45 m. wide from n. to s., and extending 20 m. into the line of land; with a coast of 110 m. Its exterior points are Brach-y-Pwll, off which lies Bardsey Isle, in Caernarvon, and Sturm Head, in Pembroke. It receives the rivers Mawddach, Dovy, Ystwith, Yren, and Teify. It has 3 to 30 fathoms water, with three reefs. A strong current sweeps round the bay from s. to n. Almost all the harbors on the coast are obstructed by bars. A great part of C. B. is said to have been once dry land, protected, as Holland now is, by dams and dikes, and containing 16 towns, and the land is said to have been submerged about A.D. 520.

CARDIGANSHIRE, *kâr'dē-gan-shir*: maritime county in s. Wales, on Cardigan Bay; area 675 sq. m., a half being waste. The surface is hilly, interspersed with fertile valleys. A rugged, bleak range of hills runs through the middle of the county, from the s.w. to the n.e., between the coast and the Teify, ending abruptly in a shelving beach in the middle of the coast, but on other parts there are rich flat

CARDIGANSHIRE.

tracts. The county contains little wood. The chief rivers are the Teify, which rises in a small lake near the centre of the county, and runs 70 m. s.e. and e. along the s. border of the county, the Claerwen, Ystwith, and Rheidol. C. contains some romantic waterfalls, especially the Rheidol Falls and the Devil's Bridge, and above 20 small lakes or llyns, noted for wild beauty. C. reposes on Lower Silurian slates and shales, containing few or no organic remains. Rich veins of copper, lead, zinc, and silver occur. The climate is cold and wet, but mild though wet on the coast. Snow lies long on the hills in winter. Summer is delightful in the valleys. C. is an agricultural county, and its chief branch of industry is the rearing of live-stock. The chief crops are oats, barley, and potatoes on the poor clay and peat soils of the mountains, and wheat, barley, and potatoes on the flat loams of the coast and valleys. The cattle and horses are small. There are some manufactures of coarse woollens and gloves, stockings and hats. Oats, barley, cattle, sheep, pigs, butter, slates, and woollens are exported. Cardigan is the county town; other chief towns being Aberystwith, Lampeter, Adpar, Aberayron, Tregaron. C. sends one member to parliament. In 834, the king of C. became king of all Wales under the title of Roderick the Great. He divided Wales among his three sons. After this the Danes and Normans overran C. The county has many remains of British and Roman camps and roads, Druidical circles, cairns, and castles. Many Welsh princes and bards were buried in the abbey of Strata Florida, 16 m. s.e. of Aberystwith, and some of the records of the principality were kept here. In C. there is a curious practice of sending presents (*biddings*) to a new-married couple, which, when sold, often realize £50 or £60. C. was disturbed, 1843-44, by the Rebecca riots. Pop. (1871) 69,712; (1881) 70,270; (1891) 62,596; (1901) 61,076.

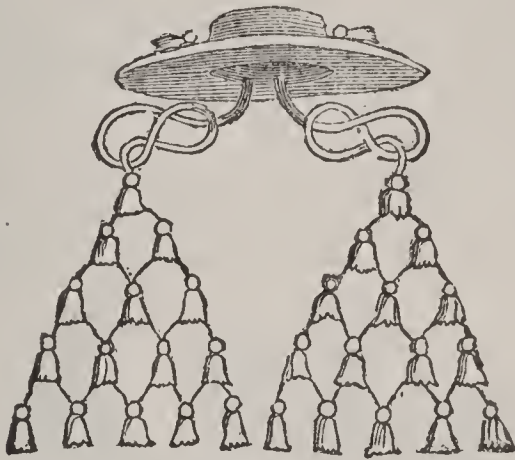
CARDINAL.

CARDINAL, a. *kâr'dĩ-năl* [L. *cardinalis*, pertaining to a hinge, chief, principal—from *cardo*, a hinge: It. *cardinale*; F. *cardinal*, principal]: pertaining to that on which other things hinge or turn; chief; principal; fundamental; denoting the chief or primary numbers, viz., one, two, three, etc., as distinguished from *ordinal* or derived names of numbers, viz., first, second, third, etc.: N. a dignitary of the Rom. Cath. Chh. next in rank to the pope; an American singing-bird of a red color. CARDINALATE, n. *kâr'dĩ-nă-lăt*, or CAR'DINALSHIP, n. the office or rank of a cardinal. CARDINAL POINTS OF THE COMPASS, the four principal points — north, south, east, and west: see COMPASS, MARINER'S.

CARDINAL, *kâr'di-nai*: dignitary in the Roman Church next after the pope, whose electors and councilors they are. The title, however, had at first a more general application. The pope being the sovereign bishop over the whole Roman Church, and having as such many duties to fulfil inconsistent with those of a particular diocese, had, from very early times, a number of bishops, priests, and deacons whom he appointed his vicars and coadjutors for the management of the diocese of Rome. The bishops exercised the episcopal function in the pope's stead, each having a peculiar church within the diocese. The priests were titular parsons of the churches in the city of Rome, and had the cure of souls. The deacons had charge of some churches and chapels of devotion, which they held as deaconries, with the additional duty of assisting the pope when he officiated in public. These three classes of ecclesiastics were called *cardinati* or *cardinales*, to denote that they were the first or chief over the rest, and that all the affairs of the diocese of Rome were under their direction. At a subsequent period, the priests and deacons of other cities of importance assumed the title of C., to distinguish them from other priests and deacons over whom they claimed supremacy; but the popes subsequently ordained that none but those whom they had chosen should be honored with that title. Among those whom the popes thus appointed were the seven bishops *suburbicarii*, who took their titles from places in the neighborhood of Rome. These bishops were called *hebdomadarii*, because they attended the pope for a week each in his turn. These cardinals took part with the Roman clergy in the election of the pope, who was generally chosen from their number. About the beginning of the 12th c., the popes having formed a regular court, began to bestow the rank of C. priest or C. deacon on any individual of the clergy, or even of the laity, whom they chose to select; and to each, whether Roman or foreign, they gave the title of some particular church in Rome, but without attaching to it any obligatory service. Thus the cardinals became a separate body elected for life, and the officiating priests of the Roman parishes were gradually deprived of the title. In 1159, Nicholas II. limited the right of election to the popedom to the cardinals thus appointed, leaving to the rest of the clergy and people of Rome merely the right

CARDINAL.

of approving of the election of a new pope, and to the emperor that of confirming it. Even these prerogatives, in course of time, were withdrawn. Notwithstanding the great powers thus intrusted to the cardinals, the bishops in the great councils of the church continued to take precedence of them; and it was not till 1614 that Louis XIII. of France, in the sitting of the parliament of Paris, adjudged precedence to the cardinals over the ecclesiastical peers—bishops and abbots. The power of the popes to appoint cardinals has often been contested, and their right to precedence denied, by the other dignified ecclesiastics. In 1567, Pope Pius V. forbade any clergyman not appointed by the pope to assume the title of C.; and Sixtus V., in December 1586, fixed their number at 70—viz., the 6 bishops suburbicarii, 50 priests, and 14 deacons, and on this footing they have since remained, though the number is seldom complete, the pope generally leaving some vacancies for extraordinary cases. The number has frequently fallen greatly under 70. When Nicholas III. was chosen pope, there were but eight cardinals; and a little before the death of Alexander IV., there were but four. Sometimes before Sixtus V. the number was exceeded, as in the pontificate of Pius IV., when there were 74. The body of cardinals is styled the Sacred



Cardinal's Hat.

College. Most of the cardinals reside in Rome, and either enjoy ecclesiastical benefices, or are employed in the administration. When not so provided for, the cardinals receive an allowance of \$100 monthly from the papal treasury. Some cardinals belong to monastic orders, and reside in their convents even after their election. The jurisdiction of the C. bishops in the place in which they are established is truly episcopal, but they are not obliged to reside. That of the C. priests and deacons is almost episcopal, but extends no further than the church and sacristy. They have there an episcopal seat under a canopy, like bishops, and they there solemnly give the people their blessing. The creation of cardinals is wholly in the pope. If the new created C. is at Rome, he goes the same day to visit the pope, who puts the red cap on his head. The red hat, which Innocent IV. ordained that cardinals should wear, to

CARDINAL BIRD.

show that they ought to expose themselves to the shedding of their blood in the cause of the church, is afterward given in a public consistory. A number of symbolical ceremonies accompany this investiture. Cardinals that are absent, when chosen, have the cap sent them by a special messenger from the pope. The hat is given by the pope's own hands; and many cardinals who do not visit Rome, die without ever having received it. The only exception is in favor of members of royal houses, to whom the hat is sent. Pope Urban VIII., in 1630, gave to the cardinals the title of Eminence, which they shared with the grand-master of the order of Malta, and the ecclesiastical electors of the German or Roman empire. The pope often employs cardinals as ambassadors, and the individual thus employed is styled *legate a latere*. A C. legate acts, or recently acted, as gov. of the n. provinces of the Papal States, which thence received the name of Legations. The chief secretary of state, the *camerlengo* or minister of finances, the vicar of Rome, and other leading officials, are always chosen from among the cardinals. The council of cardinals, when assembled under the presidency of the pope to discuss matters of church and state, is called the consistorium. There are public consistories, held on great occasions, which correspond to the levees of other sovereigns; and private and secret consistories, which are the privy council of the pope. Moreri's *Dictionary*, *voce Cardinal*, contains a list of cardinals 1119-1724, with their names, countries, etc., and dates of election and death.

CARDINAL BIRD, or RED BIRD (*Guarica cardinalis*), called also Cardinal Finch, Cardinal Grosbeak, and Virginian Nightingale: one of the finest song-birds of America.



Cardinal Finch (*Guarica cardinalis*).

It belongs to the family *Fringillidæ*, and differs from the true grosbeaks (*Coccothraustes*) in having the beak slightly bulging. The general color of the male is red, the head being vermilion, and only a small portion of the plumage around the base of the bill being black. The feathers of

CARDINAL FLOWER—CARDINAL VIRTUES.

The crown are long, and erected into a conical crest, like a red cap. The C. B. abounds in Texas, Florida, and the states of America generally, migrating northward in spring, but never farther than Massachusetts, where only a few stragglers are seen. Its loud, clear, sweet, and varied song is heard chiefly in the mornings and evenings. In size it exceeds any of the British *Fringillidæ*, being about equal to the starling.

CARDINAL FLOWER: see LOBELIA.

CARDINAL POINTS: see COMPASS, MARINER'S.

CARDINAL VIRTUES: qualities of character on which the whole of human virtue is supposed to hinge or depend. The C. V. of the ancients were justice, prudence, temperance, fortitude.

This mode of dividing the virtues is to be found as far back as Socrates. The ancient moralists treated under ethics the whole sum of human duty and virtue. Thus, Aristotle considers the great problem of the science to be the determination of man's highest good, together with the means of realizing it. Hence he includes both the social virtues and prudential regard to the welfare of the individual in the same scheme. Of the four C. V., it will be seen that the first, justice, is the social virtue; that prudence (which, properly speaking, includes temperance also) regards the well-being of the individual; while fortitude is necessary to both. This last was a virtue greatly esteemed in the ancient world, each one's lot being much less secure than with us in the present day; it was impossible to say what sufferings might be in store for the most prosperous men.

Dr. Whewell made an attempt to correct the more obvious defects of the classification, and substituted one which he deems free from those defects. The most notable omission, in the ancient scheme, judged from the modern point of view, is the absence of all reference, either expressly or by implication, to the virtue of goodness or benevolence. This was characteristic of the pagan moralists; for although good deeds were abundantly practiced among the ancients, they did not account it a part of human virtue to flow out spontaneously in every kind of active benevolence, including the most wicked and worthless among its objects. Aristotle, in discussing the various acts and outgoings of friendship, never loses sight of the *reciprocal* obligations on the other side; so that when a rich man befriends, with his wealth, one that is poor, the inequality must be made good by a greater amount of honor or respect on the part of him that is so befriended.

Accordingly, to adapt the classification to the altered point of view, benevolence has to be added to the list. This is Dr. Whewell's first virtue; the others are justice, truth, purity, and order. But the scheme, thus amended, is scarcely less objectionable than before. The virtue named last, order, which means obedience to authority, cannot but contain a very large portion of all the rest; seeing that justice, truth, etc., are enjoined by positive law.

Then, what is understood by purity, including the control of the two powerful appetites, hunger and sex, is partly prudential and partly social.

The ethical discussions of modern times may be much aided by dividing the totality of human virtue on the following plan. There are three distinct classes of human actions, which all are approved of or accounted virtuous, but on different grounds, and in a different manner.

1. There are actions forbidden by society under penalties; in other words, men are punished for committing them. Such are theft, breach of bargain, slander, violence to the person, and all the offenses against our fellow-men prohibited by the law of the land. The avoiding of all these actions is signified to be a part of our duty, by the suffering inflicted on the doers of them. The law fines, imprisons, or puts to death those who will not conform to its regulations.

The law of the land is not the only power that prescribes conduct enforced by penalties. The public opinion of the country at large forbids certain actions, and punishes transgressors by excluding them from social intercourse; such, for instance, are acts of unchastity, especially by women. There are also codes enacted by particular societies, as the code of honor among gentlemen, which constitute some actions offenses that are not so by law, or by universal opinion. Cowardice is one of the qualities most obnoxious to the code of honor.

The actions prohibited by law are obviously such as could not be allowed without the entire subversion of human society. If murder and theft were to go unpunished, one principal end for which men associate together in communities—that is, protection and security—would not be attained. It is impossible that men should not disapprove of all such actions, and approve of the contrary.

2. There are some actions accounted virtuous, while their opposites are not punished, as in the case of those now mentioned. Doing good to persons that have no claim upon us—in other words, benevolence or philanthropy—is considered highly praiseworthy; but its neglect is not usually visited with any punishment or censure; so that if it be a duty to perform acts of benevolence, it is a duty generically different from paying debts, and respecting the person and property of neighbors. The motives brought to bear on the two cases are widely contrasted: in the one, society *punishes* for doing the action forbidden; in the other, it *rewards* for doing the thing enjoined, and inflicts no punishment if it be neglected. Here lies the difference between *duty*, strictly and, in a way, legally so called, and *merit*. In the bare performance of duty there is no merit; a man would not even be commended for the punctual payment of his debts, if it were not that so many people are deficient in this respect, that in comparison with these the correct person excites a feeling of satisfaction. *Disapprobation* is the sentiment properly concerned with breach of duty; *approbation* is bestowed on all who do something over and above their duty. This distinction is known in

CARDINIA.

every department of practical life; yet speculative moralists habitually lose sight of it.

3. The virtues included under prudence are in a different position from either of the foregoing classes. Bearing the common names, virtue and duty, by which they are recognized as worthy of approbation or commendation, they are nevertheless unaccompanied with legal sanctions either of punishment or of reward. The imprudent man is subject to no legal penalty, unless he clearly involves other persons in his imprudence; and the prudent man is not rewarded with the praise, esteem, or other benefits conferred upon the benevolent man. It is true that the young are punished by parents or teachers for imprudences; and some governments take such a paternal care of their subjects, as to punish them for sins against themselves. Men have been sent to prison because of their endangering their own salvation by embracing heresy; but at the present day such a proceeding is considered beyond the function of government. Men and women, arrived at maturity, are expected to take care of their own interests; even if they do not, no one punishes them; if they do, no one rewards them. We have, it is true, a certain feeling of disesteem in the one case, and of esteem or commendation in the other; neither of which, however, attains any considerable strength until more than the individual's self is involved. In short, although we cannot divest ourselves of all sentiment as lookers-on, when men behave prudently or imprudently, our rule is *non-interference*; and this constitutes a marked distinction between the self-regarding and the social vices and virtues.

Accordingly, when ethical writers are endeavoring to probe the foundations of the moral sense in man, they ought to consider separately these three different species of conduct, for the sentiment excited by each is marked by strong peculiarities. To class social duties enforced by punishment, social virtues stimulated by rewards, and prudence accompanied by neither, under one common designation, and discuss them as essentially the same, is to confuse, instead of to clear the first principles of morality.

In Rom. Cath. systems of theology, there are declared to be four *cardinal virtues*—‘prudence, fortitude, temperance, and justice’—from which all other ‘moral’ virtues are represented as flowing. But there is a prior division of virtues into the two classes of *theological* and *moral*; the theological virtues being faith, hope, and charity. The distinction between these two classes is represented as consisting in this, that the theological virtues ‘*immediately* regard God;’ and the moral virtues do not immediately regard God, but are commanded and rewarded by God, and are beneficial to ourselves.

CARDINIA, *kâr-dîn'î-a*: genus of fossil conchiferæ, containing 85 species, which extend from the Silurian to the inferior oolite. They have an oval or oblong shell, attenuated posteriorly, and marked with lines of growth, and an external ligament. They occur abundantly in the valuable layers of clay-ironstone called ‘mussel-bands.’

CARDIOGRAPH—CARDOON.

CARDIOGRAPH, n. *kâr'dĩ-ō-grăf* [Gr. *kardĩă*, the heart; *grapho*, I write]: an instrument for registering the movements of the heart.

CARDITIS, *kâr-dĩ'tis*, or Inflammation of the Heart. disease of very rare occurrence, if the term be limited to cases of true acute inflammation of the muscular structure of the heart itself. C., however, was commonly understood in a wider sense, to include certain forms of disease of the external and internal lining membrane of the heart; and it is only since the beginning of the present century that, through improvements in medical pathology and diagnosis, the names of Pericarditis and Endocarditis (q.v.) have become common for indicating the most ordinary inflammatory affections of the heart. See HEART, DISEASES OF THE.

CARDIUM, n. *kâr'dĩ-ŭm* [Gr. *kardĩă*, the heart]: the cockle, so named in allusion to its heart-like form. For Cardium and Cardiacæ, see COCKLE.

CARDONA, *kâr-dō'nâ*: town of Catalonia, Spain about 44 m. n.w. of Barcelona. It is on a declivity on the right bank of the Cardener, is surrounded by walls, pierced with six gates, and commanded by a castle on a height. It is noted for a mountain of salt in its vicinity, which has a height of about 500 ft., and measures a league round. When the sun shines on this gigantic mass the effect is most brilliant and gorgeous. Pop. (1877) 4,360.

CARDOON, n. *kâr-dŏn'* [F. *chardon*—from It. *cardo*—from L. *cardŭs*, a thistle], (*Cynara Cardunculus*): perennial plant of the same genus with the ARTICHOKE (q.v.), native of the s. of Europe and the n. of Africa. It very much resembles the artichoke, but is larger, while the flowers (heads of flowers) are smaller. It has long been in cultivation, for the sake of the blanched leaf-stalks and midribs of the leaves, used as a salad, or more generally as a boiled vegetable during winter.

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CARDS : oblong pieces of pasteboard printed in figures, used for games. All that is certainly known of the origin of C. is that it is ancient and eastern. What is asserted by Count de Gebelin and the earliest writers upon the subject, that in their primary stage they constituted some sort of symbolic and even moral game, is not so well established. The Hindu and Chinese C. are, however, emblematic in very high degree—the former illustrating the ten avatars, or incarnations of the deity Vishnu ; and the so-called paper-tickets of the Chinese typifying the stars, the human virtues, and, indeed, almost anything. The learned Sir William Jones expresses himself convinced that the Hindu game of *Chaturaji*—the Four Rajahs or Kings—a species of highly complicated chess, was the first germ of games with C. In the wardrobe accounts of Edward I., there is an item of money paid for the use of that monarch for playing at the Four Kings—‘ad opus regis ad ludendum ad *quatuor reges*, viii.s. v.d.’—which is supposed to have been a game at C.; but how and when painted C. took the place of carved figures, is still matter of conjecture.

A pack of Hindustani C., in the possession of the Royal Asiatic Soc., presented to Captain Cromline Smith 1815 by a high-caste Brahman, was declared by the donor to be actually 1000 years old. ‘Nor,’ quoth the Brahman, ‘can any of us now play at them, for they are not like our modern cards at all.’ Neither, indeed, are they much like our own—the pack consisting of no less than eight suits of divers colors, the kings being mounted upon elephants, and the viziers, or second honors, upon horses, tigers, and bulls. Moreover, there are other marks by which the respective value of the common C. may be distinguished, which would puzzle modern players not a little—such as ‘a pineapple in a shallow cup,’ and ‘a something like a parasol without a handle, and with two broken ribs sticking through the top.’ In the Chinese dictionary, called *Ching-tsze-tung*, it is asserted that dotted C. were invented in the reign of Seun-ho (A.D. 1120), and devised for the amusement of his numerous wives : there are 30 C. in each of these packs, three suits of nine C. each, and three single C. superior to all the others. The name of one of the suits is *Kew-ko-wan*—that is to say, the nine ten-thousands of kwan, strings of beads, shells, or money ; and the titles of the other two suits are equally concise and significant. The Chinese C. have, however, a decided advantage over those of Hindustan in being oblong instead of circular.

C. do not appear to have been known in Europe until toward the end of the 14th c. ‘In the year 1379,’ writes Carelluyzo, ‘was brought into Viterbo the game at cards, which comes from the country of the Saracens, and is with them called *naib*.’ ‘Whence afterwards,’ says Mr. W. Chatto (*Origin and History of Playing Cards*, Lond. 1848), ‘perhaps Jackanapes, Jack of cards.’ This entry occurs in the accounts of the treasurer of Charles VI. of France, 1393: ‘Given to Jacquemin Gringonneur, painter, for three packs of cards, gilt and colored, and

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variously ornamented for the amusement of the king, fifty-six sols of Paris.' From the date of this year being immediately subsequent to that in which the king lost his reason, the story goes that C. were invented to divert his royal melancholy; but they were certainly of earlier use in France. The French clergy took greatly to C. about this time, and, it seems, to the ungentle game of all-fours, since they were specially forbidden that amusement by the synod of Langres, 1404.

Card-making became a regular trade in Germany 14 years after this, and it, as well as card-painting, seems to have been carried on for some time exclusively by women; the wood-engraving of C., however, did not begin until some time afterward. The pips were then very prettily imagined, the suits consisting of hearts, bells, acorns, and leaves. The place of her majesty the queen was filled by a knight in those days; and it is to Italy, and not to Germany or France, that the glory of giving *place aux dames* must be conceded. There was also no ace whatever! By 1420, gambling by means of C. had grown to such a pitch as to provoke St. Bernardo to preach against it at Bologna; and that so eloquently, as to cause his hearers to make a fire in the public place, and throw all the C. in their possession into it—a proceeding which must have been hailed with joy by the Messrs. De la Rue of that period. The signs upon Italian C., which seem to have been the first imported into England, were cups, swords, money, and clubs; but in the third year of Edward IV. their further importation was forbidden, and the home-trade of card-making protected. C. were played by that time, we read, 'in all places of worship' in England, by which was meant, not the churches, but the houses of worshipful or notable people, the gentry. Henry VII. was a card-player; and there are not a few entries in that mean monarch's privy-purse account of his majesty's little losses. His daughter Margaret, at the age of 14, was found by James IV. of Scotland—the first time he ever saw her—in the act of playing cards; and it was most probably *écarté*, for he at once 'proposed,' to her, and she 'accepted' him. There was a sum regularly allotted to the Princess, afterward Queen Mary, as pocket-money for this especial purpose; the sums given her at a time for immediate disbursement ranging from 20s. to 40s., but one entry being so disgracefully low (for a princess) as 'two and tuppence.' James I. likewise played a good deal, but so sleepily, that he required some body to hold his C. for him.

About the year 1660, heraldic C. were introduced into England, the King of Clubs being represented by the arms of the pope; of Spades, by those of the king of France; of Diamonds, by those of the king of Spain; and of Hearts, by those of the king of England. From these heraldic C., we suppose Mr. Chatto derives the word coat-card, instead of court-card, which is certainly in more general use. In 1679 a pack was published containing the history of all the popish plots, 'excellently en-

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graved on copper-plates, with very large descriptions under each card. Aspersers of this pack,' it is added by their disinterested publisher, 'plainly show themselves to be popishly affected.'

The French, from whom we derive our ordinary suits of diamond, heart, spade, and club—*carreau*, *cœur*, *pique*, and *trèfle*—were continually changing their court-cards, and representing on them all sorts of historical characters. In the earlier periods their kings were David, Alexander, Cæsar, and Charlemagne, or Solomon, Augustus, Clovis, and Constantine; about all of whom, as well as their queens, Père Daniel has the most ingenious theories. Troops, says he, however brave and numerous, require to have prudent and experienced generals. The *trèfle* or clover-plant, which abounds in the meadows of France, denotes that a chief ought always to encamp his army in a place where he may obtain forage for his cavalry; *piques* and *carreaux* signify magazines of arms, which ought ever to be well stored—the *carreau* being a sort of heavy arrow shot from a cross-bow, and which was so called from its head being squared (*carré*); *cœurs*, hearts, signified courage of both commanders and soldiers; the *ace* was the Latin *as*, and represented money, the sinews of war: and so on.

At the time of the French Revolution, the places of the card-kings were filled by four philosophers—Molière, La-fontaine, Voltaire, and Rousseau; and those of the queens by four virtues—Prudence, Justice, Temperance, and Fortitude.

Many attempts have been made to put down card-playing by the strong hand of the law; but the history of the four kings has, nevertheless, always retained its students. Not a few enthusiastic players have died with cards in their hands, such as the great Bath player Lookup, who expired at his favorite 'double dummy,' not even being permitted by inexorable death to play out the game.

The manufacture of playing-cards comprises many interesting processes. The cardboard used is of several thicknesses of paper pasted together; there are usually four such thicknesses; and the paper is so selected as to take paste, paint, and polish equally well. The sheets of paper are pasted with a brush, and are united by successive processes of cold-drying, hot-drying, and hydraulic pressure. Each sheet is large enough for 40 cards. The outer surfaces of the outer sheets are prepared with a kind of flinty coating, which gives sharpness to the outline of the various colored devices. Most packs of cards are now made with colored backs. The ground-tint is laid on with a brush, and consists of distemper color, or pigments mixed with warm melted size. The device impressed on this ground-tint is often very beautiful. Messrs. De la Rue, the leading British firm in the manufacture, employ tasteful artists, and invest a large capital, in the introduction of new patterns. On cards sold at moderate prices, the colors at the back are generally two—one for the ground, and one for the device; but some of the choicest specimens display several colors; and many of the designs are due to the pencil of Mr. Owen

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Jones. The printing of the design is done on the sheets of paper, before the pasting to form cardboard. The pips or spots on the faces of playing-cards are now *spades, clubs, hearts, and diamonds*; but at different times and in different countries there have been leaves, acorns, bells, cups, swords, fruit, heads, parasols, and other objects similarly represented. In English cards, the colors are red and black; Messrs De la Rue once introduced red, black, green, and blue for the four suits; but the novelty was not encouraged by card-players. The same makers have also endeavored to supersede the clumsy devices of kings, queens, and knaves, by something more artistic; but this, too, failed commercially; and the old patterns are still preferred. Until the last few years, the printing of cards was generally done by *stencilling*, the color being applied through perforated devices in a stencil-plate. The color employed for this purpose is mixed with a kind of paste. When there is a device at the back, the outline of the device is printed from an engraved wood-block, and the rest filled in by stencilling. The stencilling of the front and back can be done either before or after the pasting of the sheets into cardboard. One great improvement in the manufacture has been the substitution of oil color for paste or size color; and another, the substitution of printing for stencilling. Messrs. De la Rue have expended large sums of money on these novelties; for many experiments had to be made to determine how best to employ oil color so that the spots or pips may be equal-tinted, the outline clear and sharp, the pigment well adherent to the surface, and the drying such as to admit of polishing without stickiness. The plates for printing are engraved on copper or brass, or are produced by electrotype, or are built up with small pieces of metal or interlaced wire. The printing is done in the usual way of color-printing, with as many plates as there are colors (usually five), and one for the outlines; it is executed on the sheets of paper, before being pasted into cardboard. When the printing, drying, and pasting all are completed, a careful polishing is effected by means of brush-wheels, pasteboard-wheels, heated plates, and heated rollers; in such a way that the polish on the back may differ from that on the face—since it is found that two equally polished surfaces do not slide quite so readily over each other. Every pack of cards made in England for home-use pays a duty of threepence, which duty is levied on the ace of spades. The cardboard, when all the printing is finished, is cut up into cards; every card is minutely examined, and placed among the ‘Moguls,’ ‘Harrys,’ or ‘Highlanders,’ as they are technically called, according to the degree in which they may be faultless or slightly specked; and the cards are finally made up into packs. The Moguls are the best cards.

A few years ago, it was estimated that about half a million packs of cards are made annually in England, by about seven or eight firms. Card-playing is not now so general in England as it was early in the century, and the number made has consequently lessened, though the qual-

CARDUELIS—CARE.

ity has greatly improved. All the cards used in Russia, with a few exceptions, are made at an imperial manufactory in St. Petersburg, where the operations are on a large scale, and where the number of packs made exceeds many-fold the whole produce of England. The French cards are somewhat smaller and thinner than those of England. In the United States many varieties of C. are used, some of home manufacture, though there is a large importation also.

CARDUE'LIS: see GOLDFINCH.

CAR'DUUS: see THISTLE.

CARD'WELL, EDWARD, D.D.: 1787–1861, May 23; b. Blackburn, Lancashire, England. He was educated at Brasenose College, Oxford; B.A. 1809, M.A. 1812; became fellow tutor, lecturer, one of the univ. examiners 1814, Camden prof. of ancient history 1826, and principal of St. Alban's Hall, 1831, succeeding Whately. He was also constantly and variously employed in functions of importance in his univ. He published *Lectures on the Coinage of the Greeks and Romans*, 1832; editions of Aristotle's *Ethics*, abt. 1830; of Josephus's *Wars of the Jews*, 1837; of the Greek Testament, 1837; and of Bp. Gibson's *Synodus Anglicana*, 1854. The latter was on the lines of an extensive work which C. projected, to embrace the entire synodical history of the English Church, on the basis of Wilkins's *Concilia*. It began with *Documentary Annals of the Reformed Church of England*, 1546–1716 (2 vols. 1839), and was continued in a *History of Conferences* connected with Prayer-book revision, 1550–1690 (1840); *Synodalia* (2 vols. 1848); and *Reformatio Legum Ecclesiasticarum* (1850). C. died at Oxford.

CARD'WELL, EDWARD, Viscount: 1813, July 24—1886, Feb. 15; nephew of Edward C., D.D.: b. Liverpool, where his father was a merchant. He took a double first-class at Oxford 1835, was called to the bar 1838, returned to parliament for Clitheroe 1842, for Liverpool 1847, and sat for Oxford 1853–74. He followed Sir Robert Peel, and afterward joined the liberals: was sec. of the treasury 1845–46; pres. of the board of trade 1852–55; chief sec. for Ireland 1859–61, and thought he had settled the Irish land question by an act empowering limited owners to give leases, 1860; chancellor of the duchy of Lancaster 1861–64; sec. for the colonies 1864–66, and won approval by his course with regard to the Jamaica riots, 1865; member of the council of education and sec. for war 1868. The Army Regulation Bill, which abolished the old system of promotion by purchase, etc., nearly marks the close of his more eminent public services. Gladstone raised C. to the peerage 1874. He died at Torquay.

CARE, n. *kār* [AS. *cearian*, to take heed; *cear*, care: Icel. *kaeri*, complaint: Goth. *kara*, care: Gael. *carc*, care: L. *carus*, dear]: thoughtful attention: uneasiness of mind; concern; regard; charge; the object of care or love: V. to be anxious or uneasy in mind; to heed or regard. CA'RINĒ, imp. CARED, pp. *kārd*. CAREFUL, a. *kār'fúl*, full of

CAREEN—CARET.

concern; attentive to; watchful; cautious. CARE'FULLY, ad. -lĭ. CARE'FULNESS, n. the state or quality of being careful; anxiety; caution. CARE'LESS, a. without concern or thought; regardless; inattentive; unconcerned. CARE'LESSLY, ad. -lĭ. CARE'LESSNESS, n. the state or quality of being heedless or inattentive; negligence. CARE'WORN, a. crushed with care; fatigued with anxiety. TO TAKE CARE, also HAVE A CARE, be careful; take heed.—SYN. of 'care, n.': solicitude; anxiety; concern; regard; charge; management; caution; direction; oversight;—of 'careful': anxious; solicitous; cautious; provident; wary; circumspect; prudent; discreet; disturbed; troubled; thoughtful; heedful; watchful; vigilant;—of 'careless': inattentive; listless; thoughtless; heedless; negligent; remiss; supine; unthinking; in cautious; regardless; forgetful; inconsiderate.

CAREEN, v. *kă-rĕn'* [F. *caréner*, to refit—from *carène*, a keel—from OF. *carine*—from L. *carīna*, the keel of a ship: It. *carena*, bottom of a ship: Dut. *krenge*, to sail on one side]: to lay a ship on one side in order to expose the other side for cleaning or repairs by the process of *breaming* (q.v.). The operation is not as frequent as before the general use of copper sheathing for the bottoms of vessels, and the employment of caissons and hydraulic elevators to raise ships out of the water; to incline much to one side while sailing, as a ship. CAREEN'ING, imp.: N. the act of heaving down a ship on one side. CAREENED', pp. -rĕnd'. CAREENAGE, n. *kă-rĕn'āj*, place for careening a ship; expense of careening.

CAREER, n. *kă-rĕr'* [F. *carrière*; It. *carriera*, a race, a highway, a career—from L. *carrus*, a two-wheeled cart; *currus*, a chariot, a car (see CAR)]: the ground on which a race is run; course of action; course in life; procedure; a race or running; speed in motion: V. to run or move rapidly. CAREER'ING, imp. CAREERED', pp. -rĕrd'.

CAREFUL, CARELESS, etc.: see under CARE.

CARESS, v. *kă-rĕs'* [F. *caresse*—from It. *carezza*, an endearment: W. *caru*, to love: Gael. *cairich*, to soothe]: to treat with fond affection; to embrace with affection and love, as a parent a child; to fondle: N. an act of endearment; an expression of affection. CARES'SING, imp. CARESSED', pp. -rĕst'. CARES'SINGLY, ad. -lĭ.

CARE, or CARLE, SUNDAY: the Sunday before Palm Sunday, said to be so called from the practice in many parts of the country of eating gray peas, called carlings, fried in butter, pepper, and salt, on this day. This practice apparently had its immediate origin in the custom in the Rom. Cath. Church of eating hallowed beans fried at this time—these beans being described in some religious books as symbolical of confession, and their steeping before use, of meditation. The custom seems however to have had an earlier heathen origin. See Brand's *Popular Antiquities*.

CARET, n. *kă'rĕt* [L. *caret*, it wants or is wanting]: a mark thus (^), put between two contiguous words, to show

CAREW—CAREX.

in written compositions that something is omitted in a line, and that the omitted words are interlined.

CAREW', Sir GEORGE: d. abt. 1613; second son of Sir Thomas W. Carew, of Antony. He was educated at Oxford, travelled for several years, was knighted by Queen Elizabeth, and was ambassador to the king of Poland. Under James I. he negotiated the treaty of Union with Scotland, and was sent on an embassy to France. Returning 1609, he addressed to the king, *A Relation of the State of France*, with characters of Henry IV. and others of note. This Dr. Birch published in his *Historical View*, 1749, as 'a model on which ambassadors may form and digest their notions and representations.' The poet Gray called it an excellent performance.

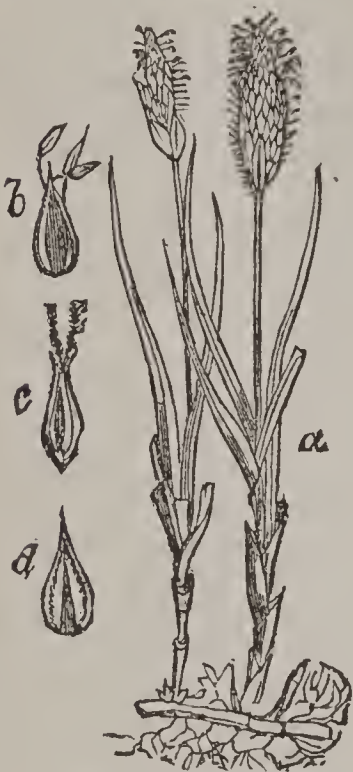
CAREW, *ka-ró'*, GEORGE, Earl of Totness, and Baron Carew of Clopton in Warwickshire: 1557-1629. He held command in the Irish wars against the Earl of Desmond and the rebels, and was successively gov. of Askeaton castle, lieut. gen. of artillery, lord pres. of Munster 1596, treasurer to the army, and one of the lords judges of Ireland. The whole island was in revolt when his labors began, and was reduced by his vigor and prudence. His chief exploit was the taking of Dunboy castle, which disappointed the Spanish allies and ended the war, 1601. He was made a peer, gov. of Guernsey, and later privy counselor to James I. His deeds are recited in *Pacata Hibernia*, a work published by his son 1633. Bp. Nicolson says he wrote 42 MS. vols. relating to Irish affairs, preserved in the library at Lambeth, and 4 more in the Cottonian library. He also translated two historical works from the French. The Camden Soc. printed some of his letters 1860. He died at London.

CAREW, *ka-ró'*, THOMAS: 1589-1639; of an old family in Gloucestershire: poet of the reign of Charles I. Having been educated at Oxford, he travelled abroad, and on his return was received at court, and patronized by Charles I. He is notable chiefly as the precursor and representative of what may be called the courtier and conventional school of poetry, whose chief characteristic was scholarly ease and elegance, with a spice of indelicacy, and even indecency. C.'s poems, mostly lyrical, and treating of trifling subjects, are among the best of their kind, and exhibit much fancy and tenderness. The best edition of his poems (pub. first 1640) is by W. C. Hazlitt (1870).

CAREX, *kā'rěks* or *kär'ěks*: genus of plants of the nat. ord. *Cyperaceæ*, of which the species are very numerous—more than 450—principally in the temperate and colder parts of the world. The English name SEDGE or SEG is sometimes employed as synonymous with C., but is popularly applied only to some of the species. This genus is distinguished by unisexual flowers, the male flowers with one glume, the female inclosed in a flask-shaped involucre. Some of the species are plants of the very humblest growth, others are two or three feet in height; all are of unpretending, grassy, or rush-like appearance. Some grow in

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wet and others in dry situations ; some are of great value in the economy of nature, as forming the principal part of the vegetation of swamps, which they gradually convert into fertile ground. The running roots, or rather *rhizomes*, of some help to bind the sands of sea-shores, particularly *C. arenaria*, which is carefully planted for this purpose on the dikes of Holland. None are valued by the agricultur-



Carex arenaria:

a, creeping rhizome, with flowering stems and spikes of flowers; *b*, a male flower, detached; *c*, a female flower, detached; *d*, a glume.



Carex Vulpina:

a, a female flower.

ist, as they are very deficient in nutritive quality, and in general they abound only in very inferior pastures, and good tillage and drainage lead to their speedy disappearance. The rhizomes of *C. arenaria*, *C. hirta*, and *C. disticha*, are sometimes used under the name of *German Sarsaparilla*, as a diaphoretic and demulcent medicine—a poor substitute for sarsaparilla. The dried leaves of *C. sylvatica* are used by the Laplanders to cover their legs and hands as a protection from frost-biting and chilblains, being worn in the inside of their shoes and gloves.

CAREY, *kā'rĭ*, HENRY C.: political economist: 1793, Dec. 15—1879, Oct. 13; b. Philadelphia; son of Mathew C. He early became a partner in his father's bookselling business; and when in 1835 he retired to devote himself to his favorite study, he was at the head of the largest publishing concern in the United States. C.'s *Principles of Political Economy* (expanded 1837) had a marked influence on economic speculation. In 1838, C. published *The Credit*

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System of France, Great Britain, and the United States; and in 1848, *The Past, the Present, and the Future*, a work of vigor and originality. In 1853 appeared *Letters on the International Copyright*; 1858, *Principles of Social Science*; 1867, *Review of the Decade 1857-67*; 1873, *The Unity of Law*. C. was originally a free-trader, but was ere long recognized as the head of a new school of political economy. According to this system, though free trade may be the ideal toward which progress should tend, a period of protection is an indispensable stage in the progress.

CAREY, *kā'ri*, MATHEW: 1760, Jan. 28—1839, Sep. 16; b. Dublin: writer and publisher. He was apprenticed to a printer 1775, published an *Essay on Duelling* 1777, and a *Letter to the Rom. Catholics of Ireland*, 1779: the latter gave rise to much excitement, and he fled to Paris, where he met Franklin and Lafayette. Returning 1780, he conducted the *Freeman's Journal* for a time, and started the *Volunteers' Journal* 1783, Oct. 13. This won rapid success as an opposition sheet, but C. was arraigned as a libeller before the commons, and committed to Newgate for an attack on parliament and the ministry. Released 1784, May 14, he sailed for America in Sep., and landed at Philadelphia Nov. 15. With \$400 sent him by Lafayette, he started the *Penn. Herald* 1785, Jan. 25. This was the first American paper to give reliable reports of debates in congress, which C. reported in person. In a duel with Col. Oswald, a rival editor, he received a wound from which he did not recover for 16 months. He edited the *American Museum*, a monthly, through 13 vols., 1787-93. His bookselling business was begun in a small way 1791, and grew till C. was the most prominent publisher in America, and a very influential citizen. His first original vol. was a *History of the Yellow Fever of 1793*. He helped Bishop White to form the first American Sunday-School-Soc., 1796. His *Miscellaneous Trifles* appeared 1798, his *American Pocket Atlas* 1801. A controversy with Cobbett culminated in *The Porcupiniad, a Hudibrastic Poem*, 1799. His *Letters and Reflections on the U. S. Bank* appeared 1810-11. His *Olive Branch, or Faults on both Sides, Federal and Democratic*, 1814, an attempt to harmonize the two parties, went through ten editions. *Vindiciæ Hibernicæ*, 1819, defended his countrymen from the charge of butchering Protestants 1640-41. His *New Olive Branch* (1820) was followed by *Essays on Pol. Econ.* (1822), which advocated protection to domestic products as essential to the welfare of America. Of this doctrine he now became the apostle, urging it in more than 50 tracts, numbering over 2,000 pages. C. was active alike in individual charities and in promoting relief associations, education, public works and internal improvements; John Sergeant said he had 'founded in Philadelphia a school of public spirit.' He pub. *Miscellaneous Essays* 1830, and contributed his autobiography to the *New England Magazine* 1833-34. He died in Philadelphia.

CAREY, WILLIAM, D.D.: 1761, Aug. — 1834; b. in humble life, Paulersbury, a village in Northamptonshire,

England: Bapt. missionary. He served his time as a shoemaker, but began to preach about his 20th year. A pamphlet which he published about this time attracted attention to foreign missions, and ultimately a missionary society, chiefly through C.'s exertions, was formed. C. and a Mr. Thomas were chosen its first missionaries to India 1793. From that time until his death, C. was indefatigable (under many difficulties, especially in his early years) in his efforts to spread the gospel among the heathen. Under his direction, the Serampore mission, of which he was the principal founder, had up to 1832 issued above 200,000 Bibles, or portions thereof, in about 40 Oriental languages or dialects, besides a great number of tracts and other religious works in various languages. A great proportion of the actual literary labor involved in these undertakings was performed by C. himself, whose Sanskrit and other grammars were highly spoken of by the late Wilson Boden, prof. of Sanskrit at Oxford. C. was oriental prof. at Fort-William College, Calcutta, 1801-30. Besides the great direct results of his labors in heathen lands, the influence of his Christian devotedness has been incalculable in awakening missionary zeal in England and America. See his *Life* by G. Smith (1884).

CARFAX, n. *kâr'fäks* [OF. *carrefourgs* — from L. *quatüör furcas*, four forks—from *quatüör*, four; *furca*, a fork]: in *OE.*, a place where four ways meet. See Skeat and Wedgwood.

CARGO, n. *kâr'gō* [Sp. *carga*, the load of a ship: F. *charger*, to load—from It. *carricare*; Sp. *cargar*, to load—from mid. L. *carricārē*, to load]: all the goods, merchandise or other articles of freight conveyed in a trading ship; freight; lading; sometimes also the invoice of the cargo. DECK CARGO, the commodities on deck, not usually included in the policy of insurance. SUPERCARGO, n. [L. *super*, over]: the person who has the charge of the cargo on board a ship.

CARGOOSE, n. *kâr'gōs* [Mahn suggests from Gael. and Ir. *cir*, *cior* (pronounced *kir*, *kior*), a crest, comb]: a fowl belonging to the Colymbus or diver family, the *Podiceps cristatus*. It is about the size of a goose: see GREBE.

CARHEIL, ÉTIENNE DE: Jesuit missionary to the Indians in Canada: dates of birth and death unknown. He began work among the Hurons and Iroquois 1668, mastered their languages, won their respect, and was still laboring, with more zeal than success, when Charlevoix left Canada, 1721.

CARIA, *kä'rī-ä*: in anc. geography, the s.w. country of Asia Minor, bounded n. by Lydia, e. by Phrygia, s.e. by Lycia, and w. and s.w. by the Mediterranean. A large portion of what was C. is mountainous. The chief ranges were called the Cadmian and the Latmian. The most important river was the *Mæander*, famous for its windings. C. was, at an early date, governed by petty princes or kings; it afterward became a part of the Persian empire, the former princes continuing to rule as satraps; and it subse-

CARIACO—CARIBBEAN SEA.

quently came into the hands of the early Macedonian kings of Egypt; and finally, with the rest of Asia, into those of the Romans. Among the chief towns were Cnidus, Halicarnassus, and Miletus.

CARIACO, *kâ-rê-â'kô*: seaport of Venezuela, at the mouth of a river, and at the head of the gulf of C.; 40 m. e. of Cumana; lat. $10^{\circ} 30'$ n., long. $63^{\circ} 40'$ w. The gulf, long and narrow, with good anchorage, and well-wooded shores, is open only on the w., and that to a portion of the Caribbean Sea, which is breasted by a chain of islands. Pop. 7,000.

CARIACOU, *kâr'î-a-kô*, or **CARJACOU**, *kâr'ja-kô*, or **VIRGIN'IAN DEER** (*Cervus Virginianus*): species of deer found in N. America, from Mexico to about n. lat. 43° , and from the Atlantic to the Pacific Ocean. It is the species commonly called Deer in the United States. It is smaller and more elegant than the common stag; of very variable color—light reddish brown in spring, slaty blue in autumn, and dull brown in winter; the belly, throat, chin, and inner parts of the limbs white. The horns of the adult male are of moderate size, bent strongly backward, and then suddenly forward, so as to bring their tips nearly above the nose; they have several snags. The fawn is profusely decked with white spots, arranged in lines, and sometimes running into stripes. The name C. is extended generically to several nearly allied species in Mexico, California, etc.

CARIAMA, or **SARIAMA**, *sâr'î-â'ma*, or **CERIEMA**, *sêr'î-ê'ma* (*Microdactylus cristatus*): bird of the order *Grallæ*, allied to the cranes, but showing points of strong resemblance to gallinaceous birds, among which it has therefore been proposed to rank it, next to the guans. It is a native of Guiana, Brazil, and Paraguay, inhabiting open plains and the outskirts of forests, where it feeds chiefly on serpents, lizards, and insects. It is larger than the common heron; the plumage is brown, finely waved with darker brown, whitish on the lower parts. When pursued, the C. seeks safety by running, and does not readily attempt to use its wings. Its voice resembles that of a young turkey. It is much esteemed for the table, and it is sometimes reared in a domesticated state.

CARIBBEAN SEA, *kâr'îb-bê'an*: largest inlet of the w. hemisphere; separated from the Gulf of Mexico by Yucatan, and from the Atlantic Ocean by the great arch of the Antilles, between Cuba and Trinidad inclusive; stretching in n. lat. from about 8° to about 22° , and in w. long. from about 61° to about 89° . The C. S. forms the turning-point in the vast cycle of waters known as the GULF STREAM (q.v.), that wheels round, with the regularity of time itself, from s. Africa to n. Europe. It pours its waters into the Gulf of Mexico on the w., which shoots forth, on the e., the Florida Stream with the computed volume of 3,000 Mississippi. To supply this enormous efflux, the C. S. draws on the Atlantic, laying under contribution nearly all the trade-wind regions of that ocean, so as literally to become the receptacle of the Amazon and the Orinoco. To the British

CARIBBEE BARK—CARICATURE.

Isles it is, from these facts, an object of peculiar interest. Rendering still warmer the warm floods which it concentrates, it imparts to the Florida Stream that high temperature which tends, with the aid of the prevalent winds, to mitigate climate from Guernsey to Shetland. In common with the islands of its eastern boundary, the C. S. takes its name from their now extinct aborigines, the Caribs.

CARIBBEE BARK, *kār-ib'bē*, or PITON BARK: bark of *Exostemma Caribæum*, a small tree in the West Indies and Mexico, of the nat. ord. *Cinchonaceæ*. The genus *Exostemma* is very nearly allied to *Cinchona*, from which it differs in having the stamens exserted, whereas in *Cinchona* they are included within the corolla. *E. Caribæum* has ovate lanceolate leaves, and is known in the West Indies as the *Seaside Beech*. C. B. has a very bitter taste, and a very faint smell. It contains none of the characteristic alkaloids of cinchona, yet very much resembles it in some of its properties, and is one of the barks sometimes substituted for the true cinchona barks.

CARIBBEE ISLANDS: see ANTILLES.

CARIBOU: see REINDEER.

CARIBS, *kār'ibz*: original inhabitants of the Caribbean Islands or southern West Indies, found by Columbus on Porto Rico, the Lesser Antilles, and the coast of what is now Venezuela and Guiana. The name meant *brave*, and they were a robust, fierce, and cruel race of cannibals, with canoes that would carry 50 men each, and a habit of attacking the gentler Yucayos of the larger islands. They were supposed to have emigrated from the region of Fla., and in the use of paint and some other customs resembled the N. American Indians. On St. Vincent Island they divided into Red and Black, the latter by intermarriage with negroes. The pure Caribs were transferred by the English about 1796 from Dominica and St. Vincent to the island of Ruatan, and thence went to the mainland of Honduras, where they now form an industrious and prosperous part of the population, chiefly in the district between the Paitook river and the Belize. They still retain their original language, said to be one of the softest and most sonorous of tongues, and to have nearly 30 dialects. These red Caribs long kept their independence, living in villages under the command of an elective chief, and gathering for war at the sound of a conch; many of their peculiar customs survive to this day. To the same race probably, if not certainly, belong the Galibi of French Guiana, who were objects of missionary effort nearly 300 years ago, the Yaoi of Venezuela and Trinidad, and other tribes of S. America.

CARICA: see PAPAWE.

CARICATURE, n. *kār'î-kă-tūr* [It. *caricatura*, an overloaded representation of anything—from *caricare*, to load: comp. Gael. *carach-gu-tur*, altogether twisted]: a twisted or distorted resemblance; a figure or description of a person or thing in which defects are greatly exaggerated in order to make ridiculous: V. to sketch or describe in order to turn

CARICATURE—CARIES.

into ridicule; to represent as very ugly. CAR'ICATU'RING, imp. CAR'ICATURED, pp. -tūrd. CAR'ICATU'RIST, n. -tū'rĭst, one who.—SYN. of 'caricature, n.': burlesque; parody; satire; travesty; sarcasm; comedy; irony.

CARICATURE, kār'ĭ-ka-tūr: representation of a face, form, or character, in which the salient features are exaggerated or overloaded, to the extent of producing a ludicrous effect, without entirely, or even essentially destroying the resemblance. C. may be regarded as the opposite of idealization; it consists in a disproportionate development of some, very frequently of one only, of the characteristics of the subject treated, while the latter is a proportionate elevation of them all. Indeed, the destruction of harmony is essential to C.; and where harmony is the prevailing quality of its subject, the required effect may frequently be produced by this means alone; whereas harmony belongs of necessity to idealization, and where its absence was the characteristic defect of the object as a real existence, an ideal of a humble kind may frequently be produced by simply restoring it.

When used with reference to sensible representation, C. stands, to the genuine productions of the plastic and pictorial arts, in the same relation in which farce stands to the legitimate drama. Both C. and farce are thus degenerate forms of art; and though requiring much cleverness for their successful execution, and often affording lively entertainment to the spectator, can scarcely be said in general to have an elevating object, or any other tendency than to divert. When used as ancillary to well-directed and merited satire, C. assumes a nobler character, and it is frequently thus employed in ephemeral English literature. A good example of C. is supplied in the pages of *Punch*.

CARIES, n. kār'ĭ-ēz [L. *caries*, rottenness: It. and F. *carie*]: the mortification of a bone in the living body; decay or rottenness of a bone, or a tooth. CA'RIOUS, a. -ūs, decayed or rotten. CA'RIOUS'ITY, n. -ōs'ĭ-tĭ, rottenness of a bone.

CARIES, kār'ĭ-ēz: disease of bone analogous to ulceration of soft tissues. It is characterized by a gradual loss of substance, from the particles of bone being absorbed, or being cast off and washed away in a purulent discharge. It begins as an unhealthy inflammation, followed by exudation of new materials, and softening of the part affected. On examination, the bone-cells are found filled with a reddish glairy fluid, and in scrofulous patients, deposits of tubercle. After C. has existed for some time, an abscess forms, and bursts; its aperture remains open, discharging a thin fluid, which contains particles of the bone. If a probe be passed through this opening, it will be felt to sink into some soft gritty substance; this is the carious bone, which, if removed, and well washed, will be found to resemble in whiteness and fragility loaf-sugar softening in hot water.

C. may attack any bone, but it usually selects the vertebræ, those of the wrist and foot, and the soft ends of long bones forming joints. To this terrible disease most deformities,

not congenital, are owing. The carious vertebræ yield under the weight of the trunk, and the spine curves forward or to one side. In the joint-ends of bones, the part enlarges, the cartilages become affected, matter forms, and amputation of the limb, or excision of the joint, is frequently necessary to save the patient's life; though too often the disease recurs with night-sweats, hectic, and death.

The causes of C. are constitutional, though it may be accidentally determined to some particular part of the body by any irritation, such as a blow, or exposure to atmospheric changes. Scrofulous persons, and those who have had syphilis or used mercury in excess at any period of their lives, are more subject to it than others. If affecting a small bone, the latter may be entirely removed; and if the disease is strictly limited to the ends of bones forming a joint, these may be excised. Within the last 30 years, great advances have been made in this department of surgery, and C. of the joints is seldom counted a sufficient reason for amputation; the knee, hip, shoulder, elbow, ankle, and wrist joints have all been repeatedly excised successfully in this country. In situations where the part cannot be reached by instruments, lotions of dilute acid may be injected, with the view of stimulating the carious surface to assume a healing action.

The treatment of C. consists in supporting the patient's strength by judicious change of air and tonics, with the administration of medicines, such as cod-liver oil in scrofula, which appear to combat the constitutional predisposition to the disease. In those parts where the diseased bone can be reached, it should be gouged or scraped away, so as to leave a healthy surface of bone, which may granulate and heal.

CARIES OF THE TEETH depends, it is supposed, on an original faulty formation of their substance, when, after any depressing cause, especially in scrofulous and ill-nourished persons, they soften and crumble away, at last laying open the cavity which contains the nervous pulp of the tooth, and producing toothache. *Treatment.*—The carious surface should be removed, and, as a substitute for the lost substance, gold or some other substance should be stuffed into the cavity. If the pulp be exposed, the hole should be stuffed with some softer material, till the parts are somewhat hardened; for this has been recommended a plug of cotton-wool dipped in a mixture of mastic, a dram, and rectified spirit or eau-de-Cologne, an ounce and a half; or of gutta-percha dissolved in chloroform.

CARIGNANO, *kâ-rên-yâ'nō*: town of Piedmont, province of Turin, about 11 m. s. of the city of Turin. It is near the left bank of the Po, in the midst of a most beautiful country; has some fine churches; also manufactures of silk-twist. This town gives name to a branch of the House of Savoy. Pop. 5,000.

CARILLON, n. *kār'îl-ôn* [F. *carillon*—from mid. L. *quadril'liōnem*, the chiming of four bells]: a chime or peal of bells, on which tunes are played: see **BELL**.

CARIMATA, *kâ-rê-mâ'tâ*: the passage between Borneo and Billiton.

CARINA—CARINTHIA.

Also, a cluster of islets in the same passage.

Also, the principal island of the group, whose highest point, a peak of 2,000 ft., is in lat. $1^{\circ} 36'$ s., long. $108^{\circ} 54'$ east.

CARINA, n. *kār-ī'nā* [L. *cārīna*, the bottom of a ship, the keel]: in *bot.*, the two partially-united lower petals of a papilionaceous flower, such as the pea, which have a keel-like shape; one of the shell valves of a cirripede. CARINATE, a. *kār'ī-nāt*, or CARINATED, a. *-nā-tēd*, keel-shaped, as the two lower petals of a papilionaceous flower; having a projecting keel as the breast-bone of most birds. CARINAL, a. *-ī-nāl*, applied to æstivation when the carina embraces the other parts of the flower. CARINATÆ, n. plu. *kār'ī-nā'tē*, those birds whose breastbone is keeled—that is, all except the ostrich and its allies.

CARINARIA, *kār-ī-nā'rī-a* or *kār-īn-ār'ī-a*: remarkable and interesting genus of gasteropodous mollusks, of the order *Heteropoda* or *Nucleobranchiata*, having a thin shell, in form somewhat like that of a limpet, which, however, covers only the visceral sac (heart, gills, etc.), leaving the greater part of the animal exposed. The shells of some of the species have been sometimes denominated *Venus's Slipper* and *Glass Nautilus*. The body is gelatinous, and so transparent that much of its interior organization can be seen. Nearly opposite the part of the back occupied by the shell is a sort of vertical fin, answering to the foot of the other gasteropods. The species of C. are all marine, are found only in the seas of the warmer latitudes, and generally swim with the back downward. Closely allied to C. is the genus *Firola*, in which there is no shell at all.

CARINI, *kā-rē'nē*: town of Sicily, province of Palermo, and 12 m. w.n.w. of the city of Palermo. It has an old castle; the people are engaged chiefly in fishing. Pop. 12,000.

CARINOLA, *kā-rē-nō'lā*: town of s. Italy, province of Caserta, 20 m. s.e. of Gaeta. It has a cathedral, and a Franciscan convent. The district produces excellent wine. Pop. 2,620.

CARINTHIA, *ka-rīn'thē-a* (Ger. *Kärnthen*): a crown-land of the Austrian empire, forming part of the old kingdom of Illyria; 3,958 sq. m., and a population, in 1900, of 367,324, which is 6,316 more than what it was in 1890. The principal river is the Drave, which passes through the country from w. to e., in a course of 150 m. The general aspect of the country is mountainous, with long deep valleys, that of the Drave widening at Villach and Klagenfurt into a great plain. The valley of the Drave divides the *Noric* from the *Carinthian Alps*. Agriculture is limited by the mountainous character of the country, great part of which is occupied in pasture, or covered with brush-wood. Many horses and cattle are reared and exported. The principal products are mineral. One of the chief branches of industry is the manufacture of hardware; the other manufactures include woollens, silk stuffs, and cottons. The capital is Klagenfurt.—The ancient inhabitants were the *Carni*, who derived their name from the Celtic word *carn*.

CARIOLE—CARLEE.

or *corn*, Lat. *cornu*, Eng. *horn*—an allusion to the craggy, horn-like pinnacles of their hills. Before the time of Augustus, it belonged to Noricum, afterward to the Roman empire. By and by the Carni were swept away in the deluge of immigration from the east, and slaves settled in the country. After some time the slaves themselves were so heavily oppressed by the Avari, that they called to their assistance a Frank, named Samo, who founded the kingdom of Carantania, which included much more than the present C., but fell to pieces after his death. Finally it came into the possession of Austria (q.v.) Only about two-sevenths of the present pop. is Slavic (Slovenians), the remainder being Germans.

CARIOLE, or CARRIOLE, n. *kār'ī-ōl* [F. *carriole*—form It. *carriuola*]: a small open carriage; a covered cart.

CARIPE, *kā-rē'pā*: town of Venezuela, S. America, 50 m. s.e. of Cumana. The valley of C. is noted for a cavern frequented by the remarkable bird called Guacharo (q.v.) Pop. of town and valley, 5,000.

CARISBROOKE: see WIGHT, ISLE OF: NEWPORT.

CARIS'SA: genus of plants of the nat. ord. *Apocynaceæ*. *C. Carandas* is a thorny shrub, much used for fences in India; and the fruit, called carandas—a berry about the size of a small plum—for tarts and preserves.

CARISSIMI, *kā rīs'e-mē*, GIACOMO: 1604-74; b. Marino, near Rome: musician. He was chapel-master at Assisi, and held the same post at St. Apollinaris in Rome 1628-74. He composed many oratorios, masses, cantatas, and motets, and is noted for effective harmony and for graceful and spirited melodies. C. introduced orchestral accompaniments to sacred music, but his great achievements were the development of the recitative and the invention of cantatas. He is considered the founder of the music of the 17th c.: his style was perfected by his pupils Bononcini, Bassani, and Scarlatti. Most of his compositions are preserved in the library of Christ Church, Oxford, and some in the British Museum.

CARK, n. *kārk* [AS. *cearig*, careful, anxious: Ger. *karg*; Dan. *karrig*, niggardly: Icel. *kargr*, stingy, sluggish: Gael. *curam*, care: W. *carcus*, solicitous]: in *OE.*, great care; fretful anxiety. CARK'ING, a. vainly anxious; causing anxiety: N. anxiety. CARKING CARE, a fretful and anxious solicitude.

CARL, or CARLE, n. *kārl* [AS. *ceorl*; Icel. *karl*, a man]: a bondman; a rude, rough man; a man. CARLINE, n. *kār'lin*, in *OE.*, a stout old woman. CARLOT, n. *kār'lōt*, in *OE.*, a rustic; a churl.

CARLEE, *kār'lē*, or KARLI: village of India, dist. of Poonah, 40 m. e. of Bombay. It is noted for a Buddhist cave-temple, 130 ft. long and 40 ft. wide, in good preservation, cut in the side of a precipitous hill, some 500 ft. above the plain. This has a double row of sculptured pillars, ending in a semicircle, with a high arched and cathedral-like roof. In front are carved lions and elephants, the latter

with drivers and howdahs occupied by two persons. On each side of the door is screen-work covered with human figures in alto-relievo. The only apparent object of devotion is the mystical chattah or umbrella. Near are smaller excavations or hermits' cells, now in decay.

CARLETON, *kârl'ton*, Sir GUY, Lord Dorchester: 1724, Sep. 3.—1808, Nov. 10; b. Strabane, Ireland: general. He served in the German campaign 1757, at the siege of Louisburg 1758, and under Wolfe at Quebec 1759; was wounded at the siege of Belleisle, and again at Moro Castle. Havana; became lieut. gov. of Quebec, 1766, gov. of that prov. 1774, and maj. gen. 1772. He attempted to retake Ticonderoga and Crown Point 1775. Oct., but was defeated and nearly captured. He was knighted for defending Quebec, 1775, Dec. 31, from the assault on which Gen. Montgomery was killed; drove the Americans from the prov., and defeated Arnold's flotilla on Lake Champlain, 1776, Oct. 13. C. was superseded by Burgoyne 1777, but succeeded Clinton as commander-in-chief of the forces in America, 1781, and did what he could to mitigate the severities of the war. He was created Baron Dorchester 1786, Aug. 21, and was gov. of Brit. N. America 1786-96. He died at Maidenhead, England.

CARLETON, *kârl'ton*, WILLIAM: 1798-1869, Jan.; b. Prillisk, county Tyrone, Ireland: popular writer of Irish tales. Bred and educated among the peasantry, and having had some scanty instruction in a hedge school, he, in his 17th year, went to an academy which a relative had opened at Glasslough, where he remained two years. Afterward a vague ambition led him to Dublin, where he arrived with only some three shillings in his pocket, and where, 1830, he published his *Traits and Stories of the Irish Peasantry*. Their freshness of style won favor, as did a second series, 1832; and, in 1839, he published a powerful story, entitled *Fardorougha the Miser*, in several passages of which, however, his humor becomes extravagant. Subsequently C. published a series of tales (3 vols., Dub. 1841), mostly of pathetic interest, but including a very genial and humorous sketch of the *Misfortunes of Barney Branagan*. The story of *Valentine M'Clutchy*, 1845, is half-political and half-religious in its tendency, defending the Irish Rom. Cath. priesthood, and advocating repeal of the Union. Other narratives—*Rody the Rover*, 1846; *The Black Prophet*, 1847; and *The Tithe Proctor*, 1849—show the author's genius. *Willey Reilly*, 3 vols., appeared 1855, and *The Evil Eye*, 1860. C. is the true historian of the Irish people, by reason of his experience and of his sympathy; and his style is graphic and picturesque. He received a government pension of £200 a year, and on his death the queen granted a pension of £100 to his widow.

CARLI, *kâr'li*, GIOVANNI RINALDO: 1720, Apr.—1795, Feb.; b. Capo d'Istria: Italian economist and archæologist. Educated at home and at Flambro in the Friuli, he was, in his 24th year, appointed prof. of astronomy and navigation at Padua. In 1754, he published the first vol. of his great

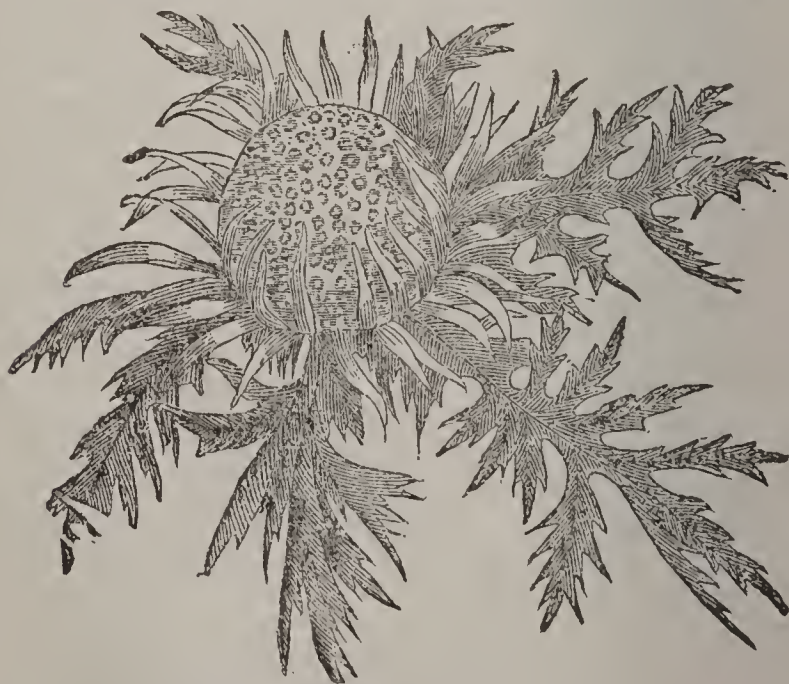
CARLINE—CARLINE THISTLE.

work *On the History of the Coins and Currency, and on the Institution of the Mints of Italy*, the fourth and last vol. of which appeared six years later. The book treats of the monetary history of Italy from the fall of the Western Empire until the 17th c., and is profusely illustrated with representations of coins, national and foreign, circulating in Italy during the various ages; and their value as compared with the price of provisions at different periods is also calculated. His merits as a financier were not overlooked. He was made pres. of the council of commerce and public economy at Milan, and afterward pres. of the new council of finances, into which branch of administration he introduced many reforms. To his influence was due the abolition of the inquisitional tribunal. He also wrote some valuable works on Istrian and other antiquities; dissertations on classical subjects; against sorcery; against Rousseau's theory of natural religion, etc. His works, exclusive of his *Italian Antiquities*, were published in 19 vols. 8vo (Milan, 1784-94).

CARLINE, *kâr'lin*, or CAROLINE, *kă'r'o-lin* [named from Carlo VI. of Naples]: silver coin current in Italy, worth about seven cents.

CARLINES, n. plu. *kâr'linz*, or CARLINGS, *kâr'lingz* [F. *carlingue*]: in a ship, short pieces of timber ranging fore and aft from one deck-beam to another, used with other pieces called *ledges*, laid at right angles with them, to sustain and strengthen the deck of a ship.

CARLINE THISTLE, n. *kâr'lin* [F. *carline*: said to be after the famous *Charlemagne*, whose army was cured of the plague by it], (*Carli'na*): genus of plants of the nat. ord. *Compositæ*, closely allied to the true thistles, from which they are distinguished by the inner scales of the in-



Carline Thistle (*Carlina acaulis*).

volucre spreading like rays, and being colored and shining. These involucral scales are remarkably hygrometric, ex-

CARLINGS—CARLISLE.

panding in dry and closing together in wet weather, and this property they retain for a long time; the heads of flowers are therefore often nailed on cottage-doors in many parts of Europe, to indicate the weather. The species, *C. acaulis*—said to have been shown by an angel to Charlemagne as a cure for the plague in his army—grows on hills and mountains, especially in calcareous soils in the middle latitudes of Europe. It has a very short stem, and very large heads of flowers, and was formerly in high repute for the medicinal virtues of its root—which is in large doses a drastic purgative—but its use is now almost confined to veterinary practice.—It grows mostly in poor soil. It has a stem about a foot high; and many purplish heads of flowers set amid straw-colored rays.

CARLINGS: peas steeped and fried; according to Sibbald, peas broiled on Care Sunday (q.v.)

CARLINGS: see **CARLINES**.

CARLISLE, *kár-līl'*: capital of Cumberland co., Penn., on the Cumberland Valley railroad, 19 m. w. by s. of Harrisburg. It is in a fertile limestone valley between the Kittatinny and South Mountains. C. was begun 1751, and two years later had five log houses, but soon became a military post and grew in importance. Washington's headquarters were here during the whisky insurrection, 1794. Here Dickinson College was founded 1783 by the Presbyterians; it was suspended 1816, revived 1822, and transferred to the Methodists 1833. United States barracks, sufficient for 2,000 men, were built near C. 1777, chiefly by the Hessians captured at Trenton; long used as a school of cavalry practice, they are now devoted to the training of young Indians; Capt. Pratt is at the head of this important institution. C. was shelled by the Confederates, 1863, July 1, at night. The town is regularly laid out, with streets at right angles, and substantially built. It has four wards, 13 churches, two banks, two weekly papers, two machine shops, and a car factory. The C. sulphur springs are four m. n. Pop. (1820) 2,908; (1840) 4,351; (1870) 6,650; (1880) 6,209; (1890) 7,620; (1900) 9,626.

CARLISLE: parliamentary and municipal borough, episcopal city, and ancient town in North Cumberland, Eng.; capital of the county, 12 m. e. of the Solway Firth, 300 m. n.w. by n. London, 101 m. s. of Edinburgh, 60 w.s.w. of Newcastle. It is a chief station on the w. railway route from London to Edinburgh, and is the terminus of seven different lines of railway. It stands on an eminence in a wide plain at the confluence of, and nearly surrounded by, the Eden, Caldew, and Peteril. Many fine new streets and buildings have been lately added to the city. The court house and county jail is a handsome pile; a public hall was opened 1875; the fine Carlisle bank was built 1876. The chief branches of industry are cotton, gingham, chintz, check, and hat manufactures; and fancy biscuits are largely made. There is salmon fishing in the Eden. The castle was founded 1092, and is now a barrack; the remains of the keep form a massive lofty tower, with a very deep well. Mary Queen of Scots was confined in the castle after the

CARLISLE.

battle of Langside. There was formerly a canal of 11 m., from Bowness on the Solway Firth to C.; but its bed was some years ago converted into a railway, from which a line branches to the newly formed port of Silloth (q.v.), on the Solway. Pop. (1763) 4,000; (1801) 10,221; (1851) 26,310; (1871) 31,049; (1891) 36,984. C. returns one member to parliament. In 1880, 654 vessels entered the port of C., of 115,971 tons burden; and 660 cleared, of 115,482 tons. Roman remains have been found here—coins, altars, inscriptions, brass incense vases, etc. Being near the w. end of Hadrian's wall, C. was probably a Roman station. It was the seat of the ancient kings of Cumbria. The Picts and Scots ravaged it. About 900, it was destroyed by the Danes, after which it remained desolate for 200 years. Thence till the union of England and Scotland, it was closely connected with the border wars, and underwent many sieges. To its being long a fortified border town it owed much of its importance and privileges, but it declined greatly after the union. The C. corporation, in 1745, proclaimed Prince Charles king of Great Britain. The Duke of Cumberland afterward took the city, and punished the chief actors with death, and the inhabitants with other cruelties. In 1133, Henry I. made C. a bishopric.—The C. tables of mortality, based on the deaths which occurred in C. 1779–87, were drawn up by Dr. Heysham, and have been ever since much used by life-insurance offices, as showing the average.

CARLISLE CATHEDRAL was commenced about 1092 by Walter, a Norman. It was founded by William Rufus, and dedicated 1101 by Henry I.; and in 1133, was made the cathedral church of the newly-formed diocese. A great part of the original Norman building was destroyed by fire 1292. The new edifice contains specimens of all the styles of early English—simple pointed, geometric, and flowing. Two-thirds of the fine Norman nave, originally 141 ft. long, were destroyed by Cromwell; the portion that was left has long been used as a parish church. In 1853, the restoration was commenced. The choir is one of the finest in England, 138 ft. long, and 72 high, and consists of eight pointed arches. The east window, consisting of nine lights, is considered the finest decorated window in England. The tower is very low, rising but one story above the choir. It formerly supported a timber spire, which was removed 1661. This cathedral has four canons.

CARLISLE', FREDERICK HOWARD, fifth Earl of: 1748, May 28—1825, Sep. 4: statesman. A man of fashion and pleasure in youth, his appointment as one of three commissioners sent by Lord North to America, 1778, to treat with the revolted colonies aroused the jeers of the opposition. The embassy failed of its purpose, but C. urged conciliatory measures in the house of lords. He was viceroy of Ireland 1780–82; afterward lord privy seal; opposed Pitt 1791–2; supported the war with the French republic 1792; advocated the union with Ireland 1800–1, and opposed the enactment of the Corn laws 1815. He published two tragedies, *The Father's Revenge* and *The Stepmother*; also sundry poems,

CARLISLE—CARLOS.

1773, 1801, etc., and pamphlets. C. was a connection and guardian of Lord Byron, who dedicated to him *Hours of Idleness*, and complimented him therein, attacked him in *English Bards and Scotch Reviewers*, and apologized in *Childe Harold*, canto iii. He died at Castle Howard.

CARLISLE, *kar-'lil'*, GEORGE WILLIAM FREDERICK HOWARD, Earl of, K. G.: 1802; Apr. 18—1864, Dec. 5. Educated at Eton and Oxford, he, 1821, obtained the Chancellor and Newdegate prizes for his Latin and English poems. He entered the public service 1826 as an attaché. In 1830, he (then Lord Morpeth), with Henry (afterward Lord) Brougham, was elected one of the representatives of the important constituency of Yorkshire, and, after the Reform Bill, for the West Riding, a position which he held in the liberal interest for several years. He was chief secretary for Ireland (1835–41) under Lord Melbourne. Rejected, 1841, by the West Riding, he was again elected, 1846, and remained one of its representatives until the death of his father (1848) called him to the house of lords. Under Lord John Russell's ministry (1846–52) he was chief commissioner of woods and forests, and afterward chancellor of the duchy of Lancaster. He was appointed lord lieut. of Ireland (1855–58), reappointed 1859. He died at Castle Howard.

CARLISLE, JOHN GRIFFIN: 1835, Sep. 5— — — —; b. Campbell co., Ky.: politician. He was in early life a school-teacher; was admitted to the bar 1858. He was a member of the State house of representatives (1859–61), and of the State senate (1866–71); lieut. gov. (1871–75). He was elected to the U. S. house of representatives, 1879, 81, and 83, and in the latter year was chosen speaker. He became U. S. senator 1890, and in 1893 Pres. Cleveland appointed him sec. of the treasury.

CARLISTS see CARLOS DE BOURBON: etc.

CARLOS, *kar'lös*, DON, Infante of Spain: 1545, July 3—1568, July 24; b. Valladolid; son of Philip II. After his recognition as heir to the throne, 1560, Don C. was sent to study at the Univ. of Alcalá de Henares, where, however, he profited so little, that the king, regarding him as unqualified to reign, invited a nephew, the archduke Rudolf, to Spain, intending to make him heir to the throne. Excluded from all participation in the government, Don C. conceived a strong aversion toward the king's confidants, and especially was unwilling that the Duke of Alva should have the government of Flanders. In confession to a priest, on Christmas eve, 1567, he betrayed his purpose to assassinate a certain person; and as the king was believed to be the intended victim, this confession was divulged. The papers of Don C. were seized, and being tried, he was found guilty of conspiring against the life of the king, and of traitorously endeavoring to raise an insurrection in Flanders. The sentence was left for the king to pronounce. Philip declared that he could make no exception in favor of such an unworthy son; but sentence of death was not formally recorded. Shortly afterward he died, and was interred in the Dominican monastery, El-Real, at

CARLOS—CARLOS DE BOURBON.

Madrid. The suspicion that he was poisoned or strangled, has no valid evidence. Schiller, in his tragedy *Don Carlos*, has widely departed from historical testimonies.

CAR'LOS, SAN: town of Venezuela, S. America, 120 m. s.w. of Caracas. The town is handsome and well laid out. The inhabitants are engaged chiefly in the rearing of cattle, and the cultivation of indigo, cotton, and coffee, of which there are still considerable plantations in the neighboring savannahs. Pop. considerably less than formerly, when it was about 10,000.

CARLOS DE BOURBON, Don MARIA ISIDOR: 1788, Mar. 29—1855, Mar. 10: second son of Charles IV. of Spain. He was educated chiefly by priests. After the expulsion of the French from Spain, his brother, Ferdinand VII., re-ascended the throne; but having married thrice without issue, Don C. began to cherish the hope of succeeding his brother. An insurrection in his interest broke out in 1825, in Catalonia; but was put down, Don C. himself not participating in it. A fourth time, however, the indefatigable Ferdinand married, and the result was a daughter, the Infanta Maria Isabella (late queen of Spain), born 1830, Oct. 10. Now, as the Salique Law, excluding females from succession to the throne, had been abrogated, the hopes of the Carlists, as the followers of Don C. were called, were destroyed. During the illness of the king, 1832, Sep., the Carlists succeeded so far as to win from him a re-institution of the Salique Law; but he revoked it again as soon as he had partially recovered, and thus Don C. was again disappointed. As he still continued his agitation, he was banished, 1833, to Portugal, and soon afterward was commanded to reside in the Papal States. But before C. had embarked for Italy, King Ferdinand VII. died 1833, Sep. 29. Don C. was now recognized as heir to the throne of Spain, not only by the Carlists, but also by Dom Miguel in Portugal; and having refused to obey the queen-regent's order for his deportation to Italy, he was declared a rebel, 1833, Oct. 16. By the quadruple alliance of Spain, Portugal, England, and France, both C. and Dom Miguel were banished from Portugal, and, 1834, June, the former embarked for England. In the following month, he returned to the continent, passed in disguise through France into Spain, where he excited an insurrection in the n. provinces, but was ultimately compelled to escape into France. In 1836, his claims to the throne were unanimously rejected by the constituent cortes. In 1844, he abdicated in favor of his eldest son; and died at Trieste.

DON CARLOS (LUIS MARIA FERNANDO), his son, better known as the Count de Montemolin: 1818–61: a second pretender to the throne. He made an attempt, 1849, to pass under a disguise through France into Spain, but failed. In 1860, a Carlist insurrection was once more attempted, in consequence of which the Count de Montemolin and his brother were arrested, but liberated after the former had signed a renunciation of all his claims to the Spanish throne, which renunciation he soon repudiated.

The present representative of the Carlist pretensions is

CARLOVINGIANS.

the nephew of Don Luis Maria Fernando, being son of Don Luis's brother Juan, bearing the name of CARLOS, DON MARIA DE LOS DOLORES JUAN ISIDOR JOSEF FRANCESCO QUIRINO ANTONIO MIGUEL GABRIEL RAFAEL: b. 1848. On his behalf, Carlist risings—speedily repressed—took place in 1869, 1870, and 1872; but the insurrection headed by Don Carlos, after the abdication of King Amadeo, 1873, proved much more formidable, and kept the n. provinces of Spain in great confusion till the beginning of 1876, when it was crushed.

CARLOVINGIANS, *kâr-lō-vîn'ji-anz*: second dynasty of Frankish kings. The origin of the family is traced to Arnulph, Bishop of Metz, who died 631. His son, Anségise, married a daughter of Pepin, of Landen in Austrasia. His sons, Martin and Pepin d'Heristall (q.v.), as the greatest territorial lords in Austrasia, were called to the office of mayor of the palace. Martin was assassinated; Pepin, by force of arms, compelled the weak Merovingian king, Theodoric III., to invest him with the office of mayor of the palace in all the three Frankish states, Neustria, Austrasia, and Burgundy. Pepin allowed the Merovingian kings to remain upon the throne, but they were kings only in name. He died 714, Dec. 17, and left as his successor his young grandson, Theodoald; but Charles Martel (q.v.), natural son of Pepin, was made mayor of the palace by the Austrasians, and in this capacity subjected the three states to his power. He died 741.

Charles Martel's two sons, Carloman and Pepin le Bref, divided the kingdom, although for a time the nominal Merovingian dynasty still subsisted; but Pepin at last formally assumed the royal power and was crowned King of the Franks. 752, May 3. This is the formal commencement of the Carolingian dynasty. Pepin began the conquest of Italy.

Pepin's sons, Carloman and Charles the Great or Charlemagne (q.v.), succeeded him, of whom the latter soon reigned alone, and prodigiously extended his dominions. In 800, Pope Leo III. set upon his head the crown of the Western Roman Empire.

Charlemagne divided his dominions among his sons, of whom, however, only one, Louis le Débonnaire, survived him, who, in the list of the kings of France, appears as Louis I., but who was properly emperor and king of the Franks. With Charlemagne, however, the high abilities of his family suddenly disappeared, and his successors showed much weakness of character. Family feuds broke out during the life of Louis le Débonnaire, who had divided his dominions in part among his sons, and he terminated an inglorious reign in 840.

By a treaty concluded 843, Aug., Lotharius I., eldest son of Louis, obtained the imperial crown and the kingdom of Italy, with Lorraine, Franche Comté, Provence, and the Lyonnois; Louis, his brother, called Louis the German, obtained the German part of his father's dominions; and Charles the Bald, son of a second marriage, obtained Neustria, Aquitania, and the *Spanish Mark*, and may almost be

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regarded as the founder of the French monarchy. The emperor Lotharius I. died in 855.

The dominions of Lotharius were again divided—his eldest son, Louis II., being emperor and king of Italy, and his two other sons kings of Lorraine and of Provence, but their kingdoms reverted to the emperor.

Charles the Fat, a son of Louis the German, having become emperor, was elected by the French nobles to be their king 882; and being previously in possession of Italy and Germany, united under his sway great part of Charlemagne's empire. But he was a weak monarch, and was deposed 887.

The imperial dignity passed to another family by the marriage of the daughter of the emperor Arnulph with Fritzlar, Count of Franconia. The French dynasty, of which Charles the Bald may be deemed the founder, continued in a succession of weak monarchs for about a century, till it terminated with the reign of Louis V., on whose death, Hugh Capet, the most powerful nobleman in France, seized the crown 987. The Carlovingian kings had for some time previous possessed no real power. A subsequent marriage, however, connected their family with that of the Capets, and enabled the kings of France to trace their descent from Charlemagne.

The Carlovingian dynasty figures in the early history of France as the ally of the church. It aided the popes against the Lombards; made war on the Aquitanians, who pillaged and despoiled the churches; established the temporal power of the successors of St. Peter; subdued and converted the still pagan Saxons; and fought the Mohammedans in Spain. The church was not ungrateful: it sanctioned, by benediction and prayer, the conquests of this powerful family; in various ways impressed its sacred stamp of approbation upon it; and for its sake resuscitated the imposing idea of an empire of the west. But this alliance, advantageous to the policy of kings like Pepin le Bref and his son Charlemagne, because they had genius, vigor, and design, became at a later period, under their feeble successors, a chief cause of the overthrow of the dynasty, for the clergy after 814 grew stronger and more exacting every day, and forced the monarchs to new concessions.

(The word Carlovingians is formed on a false analogy from Merovingians (q.v.) or Merwings; it should be *Carolings* or *Karlings*, and means pertaining to, or descendants of Karl the Great, or Charlemagne.)

CARLOVITZ, or KARLOWITZ, *kâr'lo-vitz*: town of the Austrian empire, in the 'kingdom' or province of Slavonia. It is on the right bank of the Danube, about 8 m. s.s.e. of Peterwardein, and is noted for its excellent wine, and for the treaty concluded here in 1699. The wine—especially the red variety—ranks with the best and strongest obtained in Hungary, and is largely exported. C. is the seat of the Greek abp. for the Austrian dominions. Pop. 5,000.

The important treaty of peace of C. concluded 1699, between the allies, Austria, Russia, Poland, and Venice on

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the one side, and the Porte on the other, provided that Austria should repossess the territories captured by the Turks during two centuries, including Hungary, Slavonia, etc.; that Venice should hold the Morea; that Poland should take back Podolia and part of the Ukraine; and that Russia should have the territory of Azov.

CARLOW: small inland county of Ireland, in Leinster province; about 346 sq. m., of which six-sevenths are arable. C., except in the s. extremity, where it is hilly, is a triangular fertile level, or gently undulating plain, between the Wicklow and Wexford range of hills on the e., and the highlands beyond the Barrow on the w. The chief rivers are the Barrow and Slaney. C. consists chiefly of granite, covered in the middle plain, or richer tracts, by limestone gravel, on which are fine loams and pasture. In the uplands the soil is gravelly. Lower, carboniferous limestone crops out in the valley of the Barrow. On the w. side of the county begins the great coal district of Leinster. In 1880, 77,844 acres were under crop, the chief crops being oats, potatoes, barley, and wheat. There are many dairies on the plains. The chief exports are corn, flour, meal, butter, etc. Along the Barrow, which falls more than a foot per mile, are a great many extensive corn-mills. The chief towns are Carlow, Tullow, and Bagenalstown. At Old Leighlin a synod was held 630, to settle the time of Easter. Several conflicts occurred in the county during the Irish rebellion of 1798. The chief antiquities of C. are cromlechs, castles, and the cathedral church of Old Leighlin. A cromlech near Carlow town has a covering stone 23 ft. long, and of nearly 90 tons. Pop. of C. (1841) 86,228; (1871) 51,472; (1881) 46,508; (1891) 40,899; (1901) 37,748.

CARLOW, *kár'lo*: capital town of Carlow county, Ireland; at the confluence of the Burren and the Barrow, 56 m. s.w. of Dublin by rail. It is a well-built town, with two principal streets, from which branch many smaller ones, and a suburb, Graigue, in Queen's county, on the opposite side of the river, with which it is connected by a bridge. It has a Rom. Cath. cathedral and divinity college. C. has extensive flour-mills, and is the emporium for the agricultural produce of the district, largely exported from this place. There are remains of a castle, picturesquely situated on an eminence on the Barrow, founded in 1180 by Sir Hugh de Lacy. In 1361 the Duke of Clarence established the exchequer of the kingdom in this place. It constituted one of the boundaries of the PALE, beyond which the king's writ was not recognized by the 'Irishry.' Its first charter was granted in the 13th c. by William Marshall, Earl of Pembroke. The town grew up around this castle, which was several times besieged by, and alternately in the possession of, the English and Irish. The castle (one of great extent) was in the possession of the insurgents in 1650, when it was closely invested by General Ireton and the republican army. The garrison surrendered on conditions to Sir Hardress Waller, whom Ire-

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ton had left to conduct the siege. It was then dismantled; and about one half of this once stately castle now remains a picturesque ruin. In the Irish insurrection of 1798, the insurgents attacked the town, but were repulsed by the garrison and yeomanry, and 600 of them killed. The Barrow is here navigable for small craft to its junction with the grand canal at Athy. Pop. (1891) 6,619.

CARLSBAD, *kárłs'bát*, or KAISER-KARLSBAD, *kī-zér-kárłs'bát*: town in Boemia, celebrated for its hot mineral springs, frequented in summer by visitors of the most aristocratic character from all parts of Europe. The permanent population does not amount to more than about 10,000, who are very industrious, making carpets, knives, scissors, needles, woodwork, and articles of Bohemian glass, such as are likely to induce visitors to purchase. The visitors in a season, which usually lasts from June 15 to Aug. 15, amount to 15,000 or 18,000. The wells have been frequented from a very early period, but have been of great celebrity since the 14th c. The scenery is extremely beautiful. The town is well built, the accommodation for guests good, and the place free from some of the abuses too common at other German spas. No gaming-houses are here. The temperature of the hot springs varies from 117° to 165° F. The principal spring, the Sprudel, has a very large volume, and is forced up to a height of 3 ft. from the ground. Altogether, the daily flow of the springs of C. is estimated at 2,000,000 gallons. The principal ingredient in the water is sulphate of soda. The whole town of C. appears to stand on a vast caldron of boiling-water, which is kept from bursting only by the safety-valves that the springs provide. On one occasion, after an explosion, poles of 30 fathoms in length, thrust into the aperture, did not reach the bottom. A congress of German powers was held here, 1819, Aug., in which various resolutions, denunciatory of a free press and liberal opinions, were arrived at, and measures of repression determined on.

CARLSBURG, or KARLSBURG, *kárłs'búrg*: town of Transylvania, on the right bank of the Maros, here crossed by a bridge some 200 yards in length, 48 m. s. of Klausenburg. It is built partly on a hill, and partly in a valley, is fortified, and has a citadel surrounded by walls with bastions. Gold and silver, from the mines of Transylvania, are purified and coined here. The only manufacture of importance is saltpetre. Maros Porto, the chief shipping-place for Transylvanian rock-salt, is within half a mile of the town. C. occupies the site of the ancient *Apulum*, remains of which are still found. Pop. (1880) 7,955; (1890) 8,167.

CARLSRONA, *kárłs-kró'na*: capital of the province of C., in Sweden; on the rocky island of Trotsö, and its adjoining islets in the Baltic, which are connected by bridges; lat. 56° 9' n., long. 15° 35' e. The town was built in 1680 by Charles XI., who gave it his own name, and conferred upon it several important privileges, besides making it the

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great naval station and arsenal of Sweden, instead of Stockholm. It has a magnificent harbor, with a sufficient depth of water to float the largest vessels. The only practicable entrance for large ships is defended by two strong forts. The dry docks, blasted out of the granite rock at vast expense, are an attraction to strangers. The inhabitants are employed chiefly in connection with the arsenal. Pop. (1886) 19,497; (1890) 20,613; (1901) 24,607.

The province of Carlscrona or Blekinge is in the s. of Sweden; lat. 56° — $56^{\circ} 30'$ n., long. $14^{\circ} 30'$ — 16° e.; 1,164 sq. m. It has the Baltic on its s. and e. margins. It is hilly without being mountainous, and generally fertile, yielding rye and potatoes abundantly, also wheat, oats, and peas. The fisheries employ many of the inhabitants. Pop. (1884) 139,897; (1890) 142,602; (1894) 142,690; (1901) 146,787.

CARLSHAMN, *kårls'håm*: fortified town on the s. coast of Sweden, about 30 m. w. of Carlscrona, at the end of a beautiful valley. The harbor is small but secure, and a considerable trade in iron, timber, pitch, and tar is carried on. There are manufactures of sail cloth, tobacco, hats, soap, and leather, there are also dye-works and ship-building yards. Pop. (1880) 6,402; (1890) 7,191.

CARLSRUHE, *kårlls'rô*: capital of the grand duchy of Baden, a few m. e. from the Rhine. It was founded by the Markgraf Charles-William of Baden-Durlach, 1715, and built on a curious and regular plan in connection with the palace, as the centre from which the streets diverge in the shape of an extended fan. The streets are wide and well paved. There are a number of fine buildings; flourishing educational institutions; the court library, 80,000 vols.; a public library, 90,000; and valuable collections of antiquities, objects of natural history, etc. An aqueduct from the Durlach supplies the town with water. In the market-place, the finest of the public squares, a stone pyramid incloses the remains of the founder of the city. The manufactures include machines of various sorts, engines, locomotives, railway carriages and wagons, jewelry, carpets, chemical products, and cloth. C. is generally spelt *Karlsruhe*. Pop. (1880) 49,283; (1890) 73,496; (1900) 97,185.

CARLSTAD, *kårll'ståt*: town of Sweden, on the island of Tingvalla, in Lake Wenern, about 160 m. w. of Stockholm. It is connected with the mainland by two bridges, one of which is large and very handsome. The town is well built, has a cathedral, cabinet of natural history, etc., and commands extensive views of the most beautiful scenery. Its trade is large, consisting in exports of iron, copper, timber, and corn. Pop. (1880) 7,772; (1901) 12,250.

CARLSTADT: town of Croatia, in Austria; in a rich plain, 33 m. s. w. of Agram, and on the navigable river Kulpa. It has a fortress, and is the seat of a Greek bishopric. There is a transit trade in wine, corn, and flour. Pop. 5,300.

CARLSTADT, or KARLSTADT, *kårll'ståt*, or KAROLOSTADT (real name ANDREAS RUDOLF BODENSTEIN): 1480–1541, Dec. 24, reformer. He took the name of his native

CARLTON CLUB—CARLUKE.

town in Franconia. After studying at Rome and elsewhere, he came to Wittenberg, and rose to be canon, archdeacon, D.D. 1510, dean or rector 1511, and prof. of theology 1513. He conferred the doctorate on Luther 1512; again visited Rome 1515-16; eagerly embraced the principles of the Reformation; disputed unsuccessfully with Eck at Leipzig on grace and free will, 1519; was included in the bull which condemned Luther, 1520; appealed to a general council; advocated the marriage of the clergy, and was the first to practice it. His learning made him at first a valuable aid to Luther; but while that leader was at the castle of Wartburg, C.'s zeal broke all bounds, and a mob, led or encouraged by him, destroyed the altars, images, and crucifixes in the great church at Wittenberg. Scandalized by these disorders Luther preached against them at Jena. C. obtained the pulpit at Orlamünde, put himself in open opposition to Luther, and was banished from Saxony by the elector Frederick, 1524, Sep. He now denied the real presence in the Lord's supper, and being followed by Zwingli, began the controversy which ended in the schism between Calvinists and Lutherans. Carrying his Protestantism to all lengths, he abandoned his doctor's title, denounced human learning as useless in God's service, and glorified menial labor. Suspected of encouraging the peasants' revolt in Franconia, he became a wanderer, and was reduced to great distress. Luther, on his appeal, procured him permission to return and an asylum at Kemberg near Wittenberg, on condition of his silence. This irksome restraint his fiery spirit endured for nearly three years, but broke from it, 1528, in some violent published utterances. Again a fugitive, and believed to have plotted against Luther's person, he fled to Friesland, and at last found a refuge at Zurich, where Zwingli welcomed and assisted him. Apparently he learned the wisdom of moderation, either from his woeful experiences or from the influence of 'the calm Helvetian,' for the remainder of his life seems to have been less tumultuous. After a few years as vicar of Altstettin and as archdeacon and preacher at Zurich, he became prof. of theology at Basel 1534, and retained this post till death. His followers in Germany, for a time numerous, were called Carlstadtians or Sacramentarians.

CARLTON CLUB: in Pall Mall, London, recognized headquarters of the conservative party. It was established 1832, and had (1882) 1,633 members. The entrance fee is £20, and the annual subscription 10 guineas. Of less importance are the Junior Carlton Club, established 1864, with 2,000 members; and the City Carlton Club, established 1868, with about 1,000 members.

CARLUKE, *kár'ók*: municipal burgh in the middle of Lanarkshire, Scotland, near the right bank of the Clyde, 6 miles n.w. of Lanark. The neighborhood is rich in coal, iron, and limestone, and mining is the chief industry. The orchards around cover 130 acres. Not far off is Lee, the seat of the Lockharts. Roman coins have been found here. Pop. (1881) 3,867; (1891, estimated) 5,000.

CARLYLE, *kär'ul* or *kär-ül'*, **THOMAS**: 1795, Dec. 4.—1881, Feb. 5; b. in the village of Ecclefechan, parish of Hoddam, Dumfriesshire, Scotland. Educated first at the village school, afterward at Annan grammar school, he passed to Edinburgh Univ. in his 14th year, with a view to entering the ministry of the Scottish Church. Here he studied irregularly, but with amazing avidity, and in very various fields. The views he came to adopt precluded him from becoming a minister; and for a time he taught a school at Kirkcaldy. He also began the study of law; but after a period of work as a private tutor (having the brilliant Charles Buller as pupil), he embraced literature as a profession. His first efforts were contributions to Brewster's *Encyclopædia*. In 1822, he completed a translation of Legendre's *Geometry*, to which he prefixed an Essay on Proportion, mathematics having, during his college years, been a favorite study with him. In 1823-24, had appeared in the *London Magazine* his *Life of Schiller*, and, during the same year, his translation of Goethe's *Wilhelm Meister*. In 1825, the *Life of Schiller* was recast, and published in a separate form. It was very highly praised; indeed, one can discern in the criticisms of the book certain indications of the genius of Carlyle. The translation of *Wilhelm Meister* met with a somewhat different fate. De Quincey, in one of his acrid and capricious moods, fell foul both of Goethe and his translator; while Lord Jeffrey, in the *Edinburgh Review*, admitting C.'s abilities, dealt severely with Goethe's book. In 1826, C. married Miss Welsh, a lineal descendant of John Knox, and in 1827, Jan., appeared his *Specimens of German Romance* (4 vols.). He began to write for the *Edinburgh Review* 1827, and was a contributor also to the *Foreign and Foreign Quarterly Reviews*. He was an unsuccessful candidate for the professorial chairs of moral philosophy at St. Andrews, of rhetoric in University College, London, and of astronomy at Edinburgh. From 1828-34, he resided chiefly at Craigenputtock, a small property in Dumfriesshire, belonging to his wife—the 'loneliest nook in Britain,' as he himself says. Here C. revolved in his mind the great questions in philosophy, literature, social life, and politics, to the elucidation of which—after his own singular fashion—he applied himself through life. Here also he commenced to write the splendid series of critical and biographical essays which first familiarized Englishmen with the riches of modern German thought. For this work he was incomparably better fitted than any man then living; and he was inspired by the conviction that the literature of Germany in depth, truthfulness, sincerity, and earnestness of purpose, was greatly superior to what was admired and relished at home. Gifted, moreover, in a degree altogether unexampled, with a talent for portraiture, he soon painted in ineffaceable colors on the British memory, the images of Schiller, Fichte, Jean Paul Richter, and other foreign magnates, until then almost unheard of. Gradually, educated circles awoke to the fact, that a literary Columbus had appeared among them, who had discovered a

'New World' of letters, the freshness and grandeur of which were sure to attract, sooner or later, multitudes of adventurous spirits. One of his most beautiful, eloquent, and solid essays written at Craigenputtock, was that on *Burns* (*Edinburgh Review*, 1828). It has given the tone to all subsequent criticism on the Scottish poet. The article on *German Literature*, in the same periodical, is a masterly review of a subject, the importance of which C. at length succeeded in compelling his countrymen to acknowledge. But his *chef-d'œuvre*, written on his moorland farm, was *Sartor Resartus* ('The Tailor done over,' the title of an old Scottish song). This work, like all his after-productions, an indescribable mixture of the sublime and the grotesque, was offered to various London firms, and rejected on the advice of their sapient 'tasters,' and at length published in successive portions in *Fraser's Magazine* (1833-4). It professes to be a history or biography of a certain Herr Teufelsdröckh ('Devil's Dirt'), prof. in the Univ. of Weissnichtwo ('Kennaquhair'), and contains the manifold opinions, speculations, inward agonies, and trials of that strange personage or rather of C. himself. The whole book quivers with tragic pathos, solemn aspiration, or riotous humor. In 1834, C. removed permanently to Chelsea. In 1837 appeared the first work which bore the author's name, *The French Revolution, a History*. Nothing can be more gorgeous than the style of this 'prose epic.' A fiery enthusiasm pervades it, now softened with tenderness and again darkened with grim mockery, making it throughout the most wonderful image of that wild epoch. C. looks on the explosion of national wrath as a work of the divine Nemesis, who 'in the fulness of times' destroys, with sacred fury, the accumulated falsehoods of centuries. To him, therefore, the Revolution is a 'truth clad in hell-fire.' During the same year, he delivered in London a series of lectures on *German Literature*; in 1838, another series on *The History of Literature, or the Successive Periods of European Culture*; in 1839, another on *The Revolutions of Modern Europe*; and a fourth in 1840, on *Heroes, Hero-worship, and the Heroic in History*; of these only the last has been published. Meanwhile, the first edition of his *Miscellanies* (contributions to the reviews) had appeared 1838, and his *Chartism* 1839; in 1843 followed *Past and Present*, which, like its predecessor, showed the deep, anxious, sorrowful interest C. was taking in the actual condition of his countrymen. In 1845, he published what is by many considered his master-piece—*Oliver Cromwell's Letters and Speeches, with Elucidations and a Connecting Narrative*. The research displayed in this book is something marvellous, but the author has been nobly rewarded for his toil inasmuch as his vindication of the Protector's character is most triumphant. To C. has thus fallen the unspeakable honor of replacing in the Pantheon of English history the statue of England's greatest ruler. In 1850, the *Latter day Pamphlets*, the fiercest, most sardonic, most furious of all his writings, came out. The violence of the language in those pamphlets offended many. Next year (1851) ap-

CARMAGNOLA.

peared the *Life of John Sterling*—a biography of intense fascination for the younger intellects of the age. In 1858–60 C. published *The History of Frederick the Great*, which sketches the history of Germany from the middle ages, and throws a flood of light on the politics and condition of all Europe in Frederick's time. As rector of the Edinburgh Univ., he delivered, 1866, a memorable address to the students. C.'s last published work contains a brief sketch of *The Early Kings of Norway*, and discusses the credibility of *The Portraits of John Knox*. His views on the Franco-German war and on the Eastern question were made plain in letters to the *Times* in 1870 and 1876. In 1873, he received the Prussian order *Pour le Mérite*; and in 1875, he refused the offer of the order of the Bath. In the latter year, on his 80th birthday, an address was presented to C. from above a hundred representative men and women in literature, science, and art, with a memorial gold medal; German scholars joining in a like tribute. He died at Chelsea. C. had then long been recognized as one of the greatest of modern literary men. He was fitted rather to awaken and stimulate, than to guide. He was intolerant and strong in his prejudices; his judgments seem often perverse; and his political maxims may be disputed. But none will deny his genius or fail to see in his writings the fervid earnestness, the prophetic fire, which made him one of the great moral forces of the 19th c. His style was not less remarkable for its power and graphic effect than for its abruptness, ruggedness, and eccentricity. By his own wish, C.'s remains were buried in the churchyard of his native village. His excellent wife died 1866, and so, as he said, 'the light of his life had gone out.' A few weeks after his death, Mr. Froude, whom C. had appointed his literary executor published two vols. of *Reminiscences* by C., containing many sharp personal criticisms, which provoked much comment. In *Thomas Carlyle: A History of the First Forty Years of his Life* (1882), Mr. Froude continued the task of exhibiting C. without partiality, not sparing his infirmities of temper; he subsequently published *Letters of Jane Welsh Carlyle* (3 vols. 1883); and *Thomas Carlyle: Life in London* (1884). Other vols. of C.'s biography are promised. It is undeniable that these publications have dealt roughly with the popular estimate of Carlyle, and have seriously damaged his fame as a deeply sincere though rough reformer. Mr. Froude has been sharply blamed for bringing such infirmities of temper and such lack of magnanimity into open revelation. Probably the final verdict concerning this marvellous writer is not yet uttered. It cannot deny the splendor of C.'s genius, or the height of his moral ideals; yet hardly can it assign to him that achievement of noble ideals which depends on an absolute sincerity of purpose.

CARMAGNOLA, *kâr-mân-yô'lâ*: town of n. Italy, about 16 m. s. of Turin. The *condottiere*, Francesco Bussone, afterward Conte di Carmagnola, was born here about 1390. Pop. of C. 4,000.

CARMAGNOLE—CARMINE.

CARMAGNOLE, *kâr-man-yôl'*: a popular song and dance, notorious as the accompaniment of many excesses in the French Revolution. It was sung and danced with wild enthusiasm by crowds in the streets.

CARMAN, **BLISS**: 1861, Apr. 15— ———; b. Fredericton, New Brunswick: Canadian poet. He studied at New Brunswick Univ., and later at Edinburgh and Harvard. In 1890, he became office-editor of the *New York Independent*. He has published *Low Tide on Grand Pré* (1893); *Songs from Vagabondia* (1894); *A Seamark: a Threnody for Robert Louis Stevenson* (1895); and *Behind the Arras: a Book of the Unseen* (1895).

CARMARTHEN: see **CAERMARTHEN**.

CARMEL, *kâr'mel*: mountain at the end of a limestone-ridge, 6 m. long, forming the only great promontory on the low coast of Palestine. It has a height of 1,810 ft. On the e. is the river Kishon, and the Plain of Esdraelon. Trees still grow abundantly on the mountain. The name C. means, *The garden of God*, or, 'a very fruitful region.' Mount C., the scene of Elijah's sacrifice, is renowned in Jewish history, and is often alluded to in the imagery of the prophets. On Mount C. there is a monastery, the monks in which are Carmelites (q.v.). The mountain's usual modern name, *Mar Elyas*, indicates its connection in the popular mind with the life of the great prophet.

CARMEL, KNIGHTS OF THE ORDER OF OUR LADY OF MOUNT: instituted by Henry IV. of France, and incorporated with the order of the Knights of St. Lazarus of Jerusalem. The order of Mount C. consisted of 100 gentlemen, all French, who were to attend the king in his wars, and had considerable revenues assigned to them. The order was confirmed by bull by Pope Paul V. 1607.

CARMELITE, n. *kâr'mêl-îit*: a monk of the order of our Lady of Mount Carmel. The Carmelites were founded probably as an association of hermits on Mount Carmel by Berthold, Count of Limoges, about 1156. A legend, however, ascribes the foundation of the order to the prophet Elijah; and another makes the Virgin Mary to have been a Carmelite nun. Driven out by the Saracens in the 13th c., the C. wandered over Europe; and Simon Stoch, their general, changed them into a mendicant order 1247. From that time, they shared in the usual vices of the mendicant orders. They subsequently divided into several branches, more or less rigid in their rules, one distinguished by walking barefooted. They exist at the present day in many Rom. Cath. countries. The order of *Carmelites*, or *Carmelite Nuns*, was instituted 1452, and is very numerous in Italy.

CARMINATIVE, n. *kâr-mîn'ă-tiv* [It. *carminare*, to card wool, to make gross humors fine and thin by medicines]: a medicine, such as cardamoms, peppermint, ginger, and other stimulating aromatics, used to expel wind or to cure flatulence: **ADJ.** expelling wind from; warming.

CARMINE, n. *kâr'mîn* [F. and Sp. *carmin*, carmine—

CARMÖE—CARNAC.

from Sp. *carmes*, kermes, cochineal—from Ar. *qirmizi*, crimson: It. *carminio*, carmine]: a dye of a beautiful red or crimson color bordering on purple; the coloring matter of cochineal. CARMINIC, a. -*mîn'ik*, pertaining to. Carmine is obtained from cochineal, and used in the manufacture of the finer red inks, in the dyeing of silk, in coloring artificial flowers, and in miniature and water-color painting. It was prepared first by a Franciscan monk at Pisa, who discovered it accidentally, while compounding some medicine containing cochineal; and in 1656, it began to be manufactured. It is the finest red color known, and was more largely used formerly than now for imparting a healthy glow to the complexion of the cheek. One process for its preparation is to digest 1 lb. of cochineal in 3 gallons of water, for 15 minutes: then add 1 ounce of cream of tartar; heat gently for 10 minutes; add half an ounce of alum; boil for 2 or 3 minutes; and after allowing any impurities to settle, the clear liquid is placed in clean glass pans, when the C. is slowly deposited. After a time, the liquid is drained off, and the C. dried in the shade. In the preparation of C., much depends on a clear atmosphere and a bright sunny day, as the pretty color of the C. is never nearly so good when it has been prepared in dull weather and this accounts in great part for the superiority of French C. over that prepared in England. The great expense of pure C. has led to the fabrication and vending of substitutes. The *rouge* of the theatres is made from red sandal-wood, Brazil wood, benzoin, and alum, which are boiled in brandy or vinegar till a paint of an intense red color remains. A more harmless material is obtained by evaporating the mixture till the liquid is driven off, and making up the red residue with balm of Mecca, spermaceti, or butter of cacao. The depth of the red tint may be lessened by the addition of chalk. The little color-saucers called *rouge dishes*, obtained from Portugal, contain pure C.; but imitations are made in London. *Spanish wool* and *Oriental wool*, which are impregnated with red paint, intended for use on the check for improving the complexion, are seldom genuine.

CARMÖE, or KARMÖE, *kârm'ö-ě*: island of Norway, at the entrance of the Bukke Fiord, in the North Sea, 20 m. n.w. of Stavanger; lat. 59° 20' n., long. 5° 15' e.; length 22 m., average width 5 m. A strait 2 m. in width separates it from the mainland. The inhabitants are busied principally in the fisheries, and in cattle-rearing. Pop. 6,400.

CARMONA, *kâr-mō'nâ*: town of Andalusia, Spain, 20 m. n.e. of Seville. It is on an elevated ridge, and has some manufactures. Pop. (1877) 17,421; (1890) 20,000.

CARNAC, *kâr-nâk'*: village in the dept. of Morbihan, France, 20 m. s.e. of Lorient. It is notable for the great stone monument about three-quarters of a mile from the village, on a wide desolate plain near the sea-shore. The monument consists of 1,000 or more rude broken obelisks of granite, resting with their smaller ends in the ground,

CARNAGE—CARNATIC.

rising, many of them, to a height of 18 ft., though a large proportion does not exceed 3 feet, and arranged in 11 parallel rows, forming 10 avenues, extending from e. to w., and having at one end a curved row of 18 stones, the extremities of which touch the outer horizontal rows. The origin and object of the monument remain a mystery; whether they are Celtic or pre-Celtic in date, and whether designed for religious uses or for celebration of a military exploit. There is also a large dolmen and a cairn of loose stones here. Similar but smaller structures are found to the w. of C., at Erdevén and St. Barbe.—*Pop.* (1881) 2,871; (1891) 2,901. See Lubbock's *Prehistoric Times*; Miln's *Excavations at C.* (1881).

CARNAGE, n. *kâr'nāj* [*F. carnage*, flesh time, slaughter—from mid. L. *carnāticum*, a tax paid in animals or their flesh—from L. *carnem*, flesh]: great destruction of life by violence—literally, heaps of flesh, as in slaughter-houses; havoc; massacre.—*SYN.*: slaughter; massacre; butchery.

CARNAHUBA PALM, *kâr-na-ô'ba*, or **CARANAIBA PALM** (*Copernicia cerifera*): very beautiful species of palm, which abounds in the n. of Brazil, in some places forming vast forests. It attains a height of only 20 to 40 ft.; but its timber is valuable, and is imported into Britain for veneering. The fruit is black, and about the size of an olive; it is sweet and is eaten. Scales of wax cover the under side of the leaves, and drop off when the fallen and withered leaves are shaken. This wax is melted into masses; and bees' wax is often adulterated with it. It has been imported into Britain, and used in the manufacture of candles.

CARNAL, a. *kâr'nāl* [*L. carnālis*, fleshly—from *caro* or *carnem*, flesh]: fleshly; sensual; opposed to spiritual, as *carnal* pleasure; unregenerate. **CAR'NALIST**, n. one who. **CAR'NALLY**, ad. *-lī*. **CARNAL-MINDED**, a. worldly-minded. **CARNAL-MINDEDNESS**, n. **CAR'NALISM**, n. *-izm*, or **CARNAL'ITY**, n. *-nāl'ī-tī*, grossness of mind or desire. **CARNEOUS**, a. *kâr'ně-ūs*, like flesh; fleshy.

CARNALLITE, n. *kâr'nāl-īt* [*L. carnālis*, of the color of flesh—from *caro* or *carnem*, flesh]: a compound of magnesian and potassic chlorides and water.

CARNARIA, *kâr-nā'rī-a*, or *kâr-nār'ī-a* [*L. caro, carnis*, flesh]: an order of mammalia in Cuvier's classification: see **MARSUPIALIA**: **CHEIROPTERA**: **INSECTIVORA**: **CARNIVORA**—all four formerly, and now usually the last three, being included in Carnaria, or *Feræ*; though not all are flesh-eating.

CARNARVON: see **CAERNARVON**.

CARNASSIAL, n. *kâr-nās'sī-āl* [*L. caro*, flesh; *carnis*, of flesh]: one of the molar teeth in carnivora; a tooth adapted for eating flesh.

CARNATIC, *kâr-nāt'ik*: region on the e. or Coromandel coast of India, extending inland to the Eastern Ghauts, and lengthwise from Cape Comorin to 16° n. (The name *Karnataka* was originally applied by its Mohammedan con-

CARNATION—CARNEGIE.

querors to Mysore and the country *above* the Ghauts.) The C. is no longer an administrative division, but is memorable as the theatre of the struggle of last century between France and England for supremacy in India.

CARNATION, n. *kar-nā'shūn* [F. *carnation*—from L. *caro* or *carnem*, flesh]: flesh color; a plant so called from the color of its flower—said also to be a mere corruption of *coronal* from its use in chaplets; the *Dian'thus caryōphyl'lus*, and its numerous varieties, ord. *Cār'yōphyllācēæ*. **CARNA-TIONED**, a. *-shūnd*, colored like the carnation. The carnation is one of the finest of florists' flowers, a double-flowering variety of the Clove Pink (see **PINK**), and existing only in a state of cultivation. The stem is about three ft. high, and generally needs support. The taller *Tree Carnations* are not esteemed by florists. The flowers are often three inches or more in diameter. Scarlet, purple, and pink are the prevailing colors; but whatever are the colors of a C., it is of no value in the eyes of a florist, unless they are perfectly distinct. Fullness and perfect regularity also are deemed essential. The varieties are extremely numerous: those which have only two colors, disposed in large stripes through the petals, are called *Flake Carnations*; those which have three shades of color, also in stripes, *Bizarre Carnations*; and those which have the flowers spotted with different colors, and the petals serrated or fringed, receive the name of *Picotees*. Carnations are propagated in summer either by layers or by *pipings*, which are short cuttings of shoots that have not yet flowered, each having two joints.

CARNEADES, *kār-nē'a-dēz*: B.C. 213–129; b. Cyrene, Africa: Greek philosopher. He studied logic at Athens, under Diogenes, but became a partisan of the Academy, and an enemy of the stoics, whose stern and almost dogmatic ethics did not suit his skeptical predilections. He was in fact one of the most important of the ancient skeptics, and held that no criterion of truth exists in man. He was founder of the Third or New Academy. In B.C. 155, with Diogenes and Critolaus, he was sent as ambassador to Rome, where he delivered two orations on justice, in the first of which he eulogized the virtue, and in the second proved that it did not exist. Honest Cato, who had no relish for intellectual jugglery, and thought it a knavish excellence at the best, moved the senate to send the philosopher home to his school, lest the Roman youth should be demoralized. C. died at Athens.

CARNEGIE, *kār-nā'gī*, **ANDREW**: manufacturer: b. Dunfermline, Scotland, 1835, Nov. 25. He came to the United States with his parents 1845; settled in Pittsburg, and found employment first in running a small steam-engine; became a messenger in a telegraph office and afterward one of the first operators to read by sound; entered the service of the Pennsylvania railroad co. as telegraph operator, and planned the system of running trains more rapidly and safely by means of the telegraph; was soon promoted to be chief telegraph operator of the road and

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supt. of the w. div.; and attracted the favorable attention of Thomas Scott and Edgar Thomson, with whom he joined in buying the Storey farm, on Oil Creek, for \$40,000, which yielded in one year more than \$1,000,000 in profits. He then joined the inventor of the Woodruff sleeping car in perfecting it and securing its adoption; and with others established at Pittsburg a rolling-mill, which has become the most extensive system of iron and steel industries in the world. His business interests also include the ownership of a large number of daily and weekly newspapers published in England in support of the radical party. He has accumulated a large fortune, from which he has given liberally to benevolent and educational enterprises. His benefactions include \$25,000 for public swimming baths and \$40,000 (afterward increased) for a free public library, in Dunfermline; \$50,000 for a histological laboratory in Bellevue Hospital Medical College, New York; \$50,000 for a free public library in Braddock, Penn. \$500,000 to Pittsburg for a public library; and \$250,000 to Allegheny City for a music hall and library. In 1900 his gifts were mostly for public libraries and educational institutions, which included \$10,000,000 to the U. S. Government to establish a National University to promote higher education in Washington, D. C.; \$2,000,000 to Pittsburg for a technical school, with a promised endowment of \$25,000,000; \$5,200,000 to Greater New York to establish 65 branch libraries; \$1,500,000 to the city of Philadelphia toward the extension of its free library system; \$5,000,000 to Pittsburg Institute, and also a pledge to erect an East End branch library to cost \$150,000; and \$5,000,000 to Scotland for educational purposes. Other gifts include \$4,000,000 to endow a fund for superannuated and disabled employees of the Carnegie Company; \$1,500,000 for a Temple of Peace (building and library) for the Permanent Court of Arbitration at The Hague; \$600,000 for the Tuskegee Normal and Industrial Institute in Alabama; and \$1,000,000 for the erection of a building in New York City for the various organizations of engineers.

CARNEY—CARNIVAL.

CARNEY, n. *kâr'nî* [L. *carnōsus*, fleshy—from *carnem*, flesh]: a disease among horses, in which the mouth is so furred that they cannot eat; sometimes follows a sudden change from green to dry food. Heavy feeding with grain, with irregular or insufficient exercise, is also an exciting cause. Treatment: place the horse in a well-ventilated stable, feed warm bran mash, and give flaxseed tea.

CARNEY, n. *kâr ni* [prov. and slang. comp. Gael. *carnadh*, to pile up stones on a cairn, hence to pile up flatteries]: in prov. Eng., soft hypocritical talk: V. to wheedle; to insinuate one's self by flattery. **CAR'NEYING**, imp.: ADJ. wheedling; fawning. **CAR'NEYED**, pp. *-nîd*.

CARNIFEX FERRY, *kâr'nî-fěks fěr'rî*, **BATTLE OF**: in Nicholas co., Va., on the Gaulcy river, 8 m. below Summerville, 5,000 Confederates under Gen. Floyd, entrenched on the n. bank, were attacked by a larger force under Gen. Rosecrans, 1861, Sep. 10. The action was ended by darkness, and in the night Floyd escaped, destroying his bridge behind him, leaving his equipage and munitions.

CARNIOLA, *kâr-nî-ô'la* (Ger. *Krain*): a crown-land of the Austrian empire, 3,836 sq. m.; pop. (1900) 508,150, of whom 32,000 are Germans, 17,000 Croats, the rest being Slavs of the Slovenian branch. A continuation of the Carinthian Alps passes through it in the n., and the Julian Alps in the s. The scenery of the country abounds in interesting and singular features, among which one of the most notable is the rock-bridge of St. Kanzian, 130 ft. high, and 160 ft. broad, with a perfect arch 62 ft. high, and 154 ft. long. The Save (q.v.) is the principal river. The singular lake of Zirknitz (q.v.) is in Carniola. The climate of C. is in general mild, except in the high mountainous parts. The country does not produce corn or cattle enough to supply the wants of its inhabitants, and millet, pulse, and wild-fruits are principal articles of food of many. Some districts yield excellent wines and much fine fruit. Flax, silk, maize, and honey are produced. The chief minerals are iron, quicksilver, and brown coal; the quicksilver mines of Idria are among the most important in Europe. Linen-weaving and the manufacture of a coarse lace are practiced. Laibach is the capital.

C. received its present name after the settlement here of the Slavonic Wends or Slovenians. Charlemagne conquered it. From 972 it had markgraves of its own. Part of the territory passed to the dukes of Austria in the 13th c., and the remainder was acquired by them in the 14th.

CARNIVAL, n. *kâr'nî-vâl* [F. *carnaval*—from It. *carnovale*—from L. *carnem*, flesh; *levāre*, to lighten: low L. *carnis levāmen*, the solace of the flesh—*lit.*, a lightness or solace of the flesh]: festival which originally began on the feast of the Epiphany, and continued to Ash-Wednesday, when the fast of Lent made an end of the preceding feasting, masquerading, and buffoonery; shrovetide; time of luxury. *Note.*—The popular etymology from It. *carnē*, flesh, and *vālē*, farewell, arose from a simple

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mistake in an accommodation of the spelling of the terms to the sense of the word. In later times, the C. was limited to the time of from three to eight days before Ash-Wednesday. Without doubt, the forms and customs still preserved in the celebration of the C. originated in the heathen festivals of spring-time; and they still recall partly the Lupercalia and Bacchanalia of s. Europe, and partly the Yule-feast among northern peoples. Banquets of rich meats and drinking-bouts were the chief attractions of the C. during the middle ages. Shrovetide (q.v.), or Shrove-Tuesday, called also Fasten-Even or Pancake-Tuesday, was a relic of the English C., and formerly a season of extraordinary sport and feasting. The rich commenced the festive time at the feast of Epiphany, or on 'Three Kings' Day; but the middle classes restricted their days of revelry to the week immediately preceding Lent; while the poor indulged in only a few days of mad mirth. The several chief days of C. had distinct names, such as 'fat' or 'greasy Sunday,' 'blue Monday' (or 'fool's consecration'), etc. The Tuesday before the beginning of Lent was especially styled C.—the *Fastnacht* of the German people. In most countries, especially where Protestantism prevails, the celebration is confined to wearing of masks, processions in costume, and masked balls. But in Italy, especially the cities, it is still a popular festival of universal observance. Venice used to be pre-eminent for the splendor of its observances; the C. of Rome is now the best known, though Milan and Naples vie with it. At Rome, races of riderless horses along the crowded Corso are one of the chief items in its celebration; as also the throwing of plaster confections from the windows and balconies on the occupants of the carriages and processional cars, and a return fire from below. In Germany the C. is observed not merely in Rom. Cath. towns like Munich and Cologne, but in Leipzig, Hamburg, and Berlin.

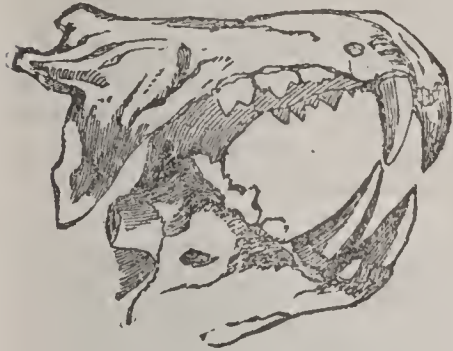
CARNIVORA, n. plu. *kâr-nîv'ô-ră* [L. *carnivorus*, feeding on flesh—from *carnem*, flesh; *voro*, I eat greedily]: flesh-eating animals. CARNIV'ORAC'ITY, n. *-răs'î-tî*, greediness for flesh. CARNIV'OROUS, a. *-ô-răs*, feeding on flesh.

CARNIV'ORA: a great order of Mammalia (q.v.), naturally separated into two divisions: (1) the *Fissipedia*, including all the land carnivores, and (2) the *Pinnipedia*, or aquatic forms. The former exhibit marked affinities to the Insectivora and even to the Marsupialia, while the more highly specialized Pinnipedes lead directly toward that extreme modification of the carnivorous type which we find in the Cetacea.

The fissipede carnivores have the usual number of incisor teeth—six in each jaw. The digits are free and provided with powerful claws, and the terminal phalanx which bears the claw is retracted upon the middle phalanx by an elastic ligament when the flexor muscle of the digits is not in action, and the claw is thus protected from wear in walking. This arrangement is best developed in the most finely carnivorous forms—the feline alliance. The cerebral hemispheres are

CARNIVORA.

long and well convoluted, and the olfactory lobes are large. The bones are comparatively slender, yet of great strength and extremely close texture, while the skull is characterized not merely by its density, but by the great shortening of the jaws, the transverse elongation and narrowing of the condyles to admit only of an up and down cutting movement, as well as by the development of large bony ridges upon the top and sides of the skull for the attachment of the enormous jaw muscles. The teeth, too, are more or less



Jaws and Teeth of Lion.

completely modified for cutting and mincing the flesh of their victims, and the higher carnivores are thus very strongly contrasted with the herbivores, whose long weak jaws and ridged teeth are as completely adapted for the slow and prolonged grinding of their less nutritious food. The stomach is always simple, and the alimentary canal is short —

sometimes, as in the lion, not more than three times the length of the body, while that of vegetable feeders may vary from 12 to 30 times their own length. The body is thus comparatively light and slender, an advantage of great importance in chasing or springing upon prey.

The most familiar carnivores, the dog, bear, and cat, may conveniently be taken as types of the three great sections of land carnivores—the *Cynoidea*, *Arctoidea*, and *Ailuroides*—which are distinguished by numerous important characters, chiefly of osteological detail. The *Cynoidea* include the species of *Canis* (dog, wolf, jackal, fox, etc., q.v.), together with a few aberrant forms, such as the long-eared fox (*Megalotis*) and hyena-dog (*Lycaon*) of s. Africa, and are undoubtedly the least differentiated group. They are all digitigrade, and possess an almost typical dental formula; though only two upper molars above three lower are present. The *Ailuroides* include five families; (1) *Viverridae* (civet, ichneumon, etc., q.v.); (2) *Proteridæ*, including only the aard-wolf (*Proteles*), intermediate between civets and hyenas; (3) *Cryptoproctidae*, also monotypic, including only the *Cryptoprocta* of Madagascar, intermediate between civets and cats; (4) *Hyenidae* (Hyena, q.v.); and (5) *Felidae* (cat, lion, tiger, leopard, puma, lynx, cheetah, etc., q.v.). These are considerably specialized above the canine type, being mostly digitigrade, with full retractile claws, having the molar series more and more reduced, so that in the cats and hyenas only one remains above and below; and the last upper premolar and first lower molar always forming the *Carnassial* teeth, which cut like powerful scissors. The *Arctoidea* contain three important families: (1) *Ursidae*, including the numerous species of bears (q.v.); (2) *Procyonidae* (the racoon, kinkajou, etc., q.v.); and (3) the vast and heterogeneous group of *Mustelidae*, including the marten

CARNIVOROUS PLANTS—CARNOT

and sable (*Mustela*), the weasel, ermine, pole-cat, and ferret (*Putorius*), as well as the ratel, glutton, badger, otter, and sea-otter (q. v.). The Arctoidea are plantigrade, their skulls comparatively long, and their teeth more or less tuberculated, some of the bears being indeed almost completely herbivorous. The otter and sea-otter (*Enhydris*) exhibit a most distinct transition to the seals, the habit being aquatic and the feet webbed; while in the latter genus the hind feet are permanently directed backward, the base of the skull too thin, and the dentition reduced.

The palæontology of the Carnivora is of the greatest interest, for not only do the three great families run back to such perfectly intermediate and apparently ancestral forms as the eocene 'bear-dog,' *Arctocyon*, but many genera occur which not only break through the divisions between the existing families, but link these closely to the marsupials.

The *Pinnipedia* are divided into three families—the *Otaridæ*, eared-seals or sea-lions (*Otaria*); the *Trichechidæ*, including only the walrus (*Trichechus*); and the *Phocidæ*, or true seals (*Phoca*, etc.).

See Huxley, *Comp. Anat. of Verteb. Anim.*, and Cassell's *Natural History*, vol. ii.

CARNIVOROUS PLANTS: see DIONÆA: SUNDEW.

CARNOCHAN, *kâr'nök-én*, JOHN MURRAY, M D.: 1817–87, Oct. 28; b. Savannah, of a Scotch father and a mother descended from Gen. Putnam. He studied in Paris, London, and Edinburgh, and began to practice 1847 in New York, where he rapidly rose to eminence, and became prof. of surgery in the N. Y. Medical College, 1851–63. A number of his operations marked new departures in surgery. He amputated the entire lower jaw, 1852, and cured *elephantiasis arabum* by tying the femoral artery. He exsected the entire radius 1853, the entire ulna 1854, and the entire trunk of the second branch of the fifth pair of nerves, 1856, to cure neuralgia. He repeatedly amputated at the hip joint. C. published a *Treatise on Congenital Dislocations* (1850), *Contributions to Operative Surgery*, and other works, besides translating Sedillot's *Operative Medicine* and Rokitsansky's *Pathological Anatomy*. He died of apoplexy in New York.

CARNOT, LAZARE HIPPOLYTE: 1801, Apr. 6—1888; b. St. Omer: one of the leaders of the French democracy. In early life a disciple of St. Simon, he, like others, left that school on account of the lax morals advocated by *Enfantin*—protesting against 'the organization of adultery'—and devoted himself to the inculcation of a more orthodox and virtuous socialism in various periodicals. In 1847, he declared himself a republican in his brochure, *Les Radicaux et la Charte*; and, after the February revolution, was appointed minister of public instruction, but soon resigned. In 1863, he entered the corps législatif and the national assembly 1871. He was elected a senator for life 1875. He wrote *Exposé* of St. Simonianism and *Mémoires* of Henri Gregoire and of Barrère. His son is (1888, March) president of the French republic,



Two Varieties of Carnation.



Carnivora.—Skull of Tiger.



Branch of Carob.

CARNOT—CAROB.

CARNOT, *kâr-no'*, LAZARE NICOLAS MARGUERITE: 1753, May 13—1823, Aug. 2; b. Burgundy: milit. engineer, In 1791, he became a member of the assembly, and voted for the death of Louis XVI. After gaining the victory of Wattignies, he was intrusted with the chief direction of milit. affairs. In 1797, having opposed Barras, C. was sentenced to deportation, but escaped into Germany. Returning to Paris, he became minister of war, 1800. In 1814, he took command of Antwerp, which he heroically defended. During the Hundred Days, he held office as minister of the interior; and after the second restoration, retired first to Warsaw, and next to Magdeburg, where he died.

CARNOT, MARIE FRANÇOIS SADI: statesmen: b. Limoges, France, 1837, Aug. 11; son of LAZARE HIPPOLYTE C., and grandson of LAZARE NICOLAS MARGUERITE C. He was educated for a civil engineer in the Polytechnic School and the School of Bridges and Roads; engineer in charge at Annecy 1864-70; commissioner extraordinary to organize the national defense of the depts. of Seine-Inférieure, Eure, and Calvados 1870; prefect of the dept. of Seine-Inférieure 1871; elected member of the national assembly and sec. of the 'republican left' 1871; supported all measures for the definite establishment of a republic; and served on several influential and technical committees. In 1876 he was elected member of the chamber of deputies and its sec.; 1877 was one of 363 deputies of the 'left' re-elected; 1878 was appointed under-sec. of public works; 1880 minister of public works; 1882 minister of finance, holding the office by reappointment till 1886, Dec. 11; and 1887, Dec. 4, was elected pres. of the republic to succeed Jules Grévy (q.v.) by a vote of 616 in a total of 824. During a fête given in his honor at Lyons, he was assassinated by an Italian anarchist named Santo, 1894, June 24.

CARNOUS, n. *kâr'nūs*, or **CARNOSE**, a. *kâr-nōs'* [L. *car-nōsus*, full of flesh—from *carnem*, flesh]: in bot., fleshy—applied to albumen having a fleshy consistence. **CARNOSITY**, n. *kâr-nōs'î-tî*, a small fleshy excrescence.

CARO, *kâ-ro'*, ELME-MARIE: 1826-87, July 13; French metaphysician: member of the *Académie Française* and of the *Académie des Sciences Morales et Politiques*. His lectures at the Sorbonne, through 20 years, were very popular, especially among ladies of rank, who were attracted by C.'s elegant rhetoric and persuasive oratory, perhaps also by the mystical vagueness of his discourses: hence C. was known as 'the ladies' philosopher.' He largely followed V. Cousin, and vigorously attacked the doctrines of Schopenhauer and Hartmann. Some of his titles were: *Materialism and Science*, *Positivism and Contemporary Religion*, *Sensualism in Literature*, *Pessimism in the 19th Century*. C. was one of the most brilliant writers in the *Revue des Deux Mondes* and the *Journal des Savants*. He died in Paris.

CAROB, n. *kâr'ōb* [F. *caroube*—from It. *carruba*; Sp. *garrobo*; Ar. *kharrub*], also **ALGARоба**, *āl'ga-rō'ba*, or **LOCUST-TREE** (*Ceratonia siliqua*): evergreen tree of the nat.

CAROL—CAROLAN.

ord. *Leguminosæ*, sub-order *Cesalpinieæ*; native of the countries around the Mediterranean Sea; in size and manner of growth much resembling the apple-tree, but with abruptly pinnate dark evergreen leaves, which have about two or three pair of large oval leaflets. The flowers are destitute of corolla; the fruit is a brown leathery pod, 4-8 inches long, a little curved, and containing a fleshy and at last spongy and mealy pulp, of an agreeable sweet taste, in which lie a number of shining brown seeds, somewhat resembling small flattened beans. The seeds are bitter and of no use, but the sweet pulp renders the pods an important article of food to the poorer classes of the countries in which the tree grows. They are very much used by the Moors and Arabs. They are also valuable as food for horses, for which they are much employed in the s. of Europe, and have of late years begun to be extensively imported into Britain, under the name of *Locust Beans*, which name and that of *St. John's Bread* they have received in consequence of an ancient opinion or tradition, that they are the 'locusts' which formed the food of John the Baptist in the wilderness. It seems probable that they are the 'husks' (*keration*) of the parable of the prodigal son.—The Arabs make of the pulp of the C. a preserve like tamarinds, which is gently aperient.—It is thought that the introduction of the C. tree into the north of India would be an important addition to the resources of that country, and a valuable safeguard against famine. The produce is extremely abundant, some trees yielding as much as 800 or 900 lbs. of pods. The wood is hard, and much valued, and the bark and leaves are used for tanning.—The locust tree (q.v.) of America is quite distinct from this

CAROL, n. *kār'öl* [OF. *carole*, a dance: W. *coroli*, to dance; *carol*, a carol, a song—from *cór*, a circle: Gael. *car*, a twist, a bend: L. *corolla*, a garland, a chaplet]: properly a round dance with twisting and bending; a song of joy and exultation; a song in general: V. to praise or celebrate in song; to sing in joy; to warble. CAR'OLLING, imp.: N. a song or hymn. CAR'OLLED, pp. -*öld*. Carol has long been applied especially to a Christmas hymn (see CHRISTMAS CAROL), and of late is associated similarly with Easter.

CAROLAN, *kār'o-lan*, or O'CAROLAN, TURLOUGH: abt. 1670-1738, Mar. 25; b. Newtown near Nobbu, co. Meath: most famous of modern Irish bards. His father was poor, and total blindness, resulting from small-pox at the age of 17, led C. to become an itinerant minstrel. Furnished with a harp, a horse, and an attendant, he began at 21 to make a circuit of gentlemen's houses, chiefly in Connaught, and was entertained as a friend, never playing for hire. He composed more than 200 songs, words and music, a good proportion celebrating the virtues of his benefactors; many of them are preserved among the Irish MSS. in the British Museum. C.'s poetical Remains, with English translations, were printed in Hardiman's *Irish Minstrelsy*, 1831. He was buried at Kulronan.

CAROLINA PINK—CAROLINE ISLANDS.

CAROLINA PINK: see SPIGELIA.

CAROLINE, *kār'o-līn*, AMELIA ELIZABETH, Queen: wife of George IV. of Great Britain; 1768, May 17—1821, Aug. 7; second daughter of Charles William Ferdinand, Duke of Brunswick Wolfenbüttel, and of the Princess Augusta of Britain. She spent her youth under great restraint at her father's court. In 1795, she was married to the Prince of Wales. The marriage was disagreeable to him, and although she bore him a daughter, the Princess Charlotte, he separated from her immediately on her recovery from childbed, and she lived by herself in a country residence at Blackheath, the object of much sympathy, the people regarding her as the victim of her husband's love of vice. Reports to her discredit led the king, in 1808, to cause investigation to be made into her conduct, which was found to be imprudent, but not criminal. In 1814, she obtained leave to visit Brunswick, and afterward to make a further tour. She visited the coasts of the Mediterranean, and lived for some time on the lake of Como, an Italian, by name Bergami, being all the while in her company. When her husband ascended the throne 1820, she was offered an annuity of £50,000 sterling to renounce the title of queen, and live abroad; but she refused and made a triumphal entry into London, whereupon the government instituted proceedings against her for adultery. Much that was very offensive was proved as to her conduct; but the manner in which she had been used by her husband, and the splendid defense of Brougham, caused such a general feeling in her favor that the ministry were obliged to give up the divorce bill, after it had passed the house of lords. She now fully assumed the rank of royalty, but was refused coronation, and turned away from the door of Westminster Abbey on the day of the coronation of her husband.

CAROLINE BOOKS (*Libri Carolini*, or *Opus Caroli*): answer of Charlemagne to Alcuin, censuring the Synod of Nicæa, 787, and the part of Pope Adrian I. therein. The controversy concerned image-worship: Charles was displeased with the pope and the Byzantine court, and had forwarded the acts of this synod to Offa of England, who laid them before his bishops. Alcuin, who was then in England, wrote some comments, and gave them to Charlemagne in the name of the English princes and bishops; this letter is lost, but it was the immediate or nominal occasion of the C. B. Divided into four books and 120 chapters, the C. B. laid down a principle which at once leaves Christian art free and guards against the superstitious misuse of it as establishing doctrine and directing worship. The synods of Frankfort, 794, and Paris, 825, accepted the C. B. as an authority. They were first printed by Jean du Tillet, Paris, 1549.

CAROLINE ISLANDS: archipelago in the Pacific Ocean, e. of the Philippine Islands, and n. of New Guinea; from lat. 3° to 11° n., and long. 135° to 177° e. They were probably first visited by Saavedra 1528: the name was given

CAROLINE MATILDA—CAROTID ARTERY.

in honor of Charles II. of Spain by Admiral Lazearo, who discovered a group 1686. They are claimed by the Spaniards, who divide them into Western, Central, and Eastern C. The Western are the Pelew Islands (q.v.). The Central C., or C. proper, consist of 400 to 500 islands, in abt. 48 groups; omitting three remote islands, all these are within an area of 20 sq. m. The Ngoli, Gulu, or Matelotas group has three islands n.e. of the Pelews, with a few inhabitants from Yap. Yap or Guap is further n.e., about 10 m. long, and has a good harbor on its s.e. side. The natives are superior to most of their neighbors, with villages regularly laid out and paved streets; they build stone piers and wharves, make good boats, and cultivate the betel-nut with care. A Spanish mission is located here. Yap is described in the *Godeffroy Journal* for 1873, as also the Ulithi, Elivi, or Mackenzie group, which had been visited and written on by Capt. Wilkes of the United States exploring expedition. The Hugolen or Rug group, discovered by Duperrey 1824, has five large and 40 smaller islands, with nearly 35,000 inhabitants of two different races, red and black, who make war on each other. The Mortlock or Young Williams group, discovered 1793, has three atolls, Satoan, Etal, and Lukunor, with 3,400 inhabitants of Samoan origin, said to be the only idolaters in these islands. Nutik or Raven Island, n.e., was discovered 1773. Puynipet or Ascension with two low atolls comprises the Seniavine group, so called by Admiral Lütke. Here are a few whites and an American mission; there were but 2,000 natives in 1858. This island is a rendezvous for whalers, and contains some curious ruins. By treaty, 1899, Feb. 12, these islands, with the exception of Guam (the largest of the Ladrone Islands), which had been ceded to the U. S. in 1898, passed from Spain to Germany, 1899, Oct. 1. The price paid by Germany was 16,750,000 marks (about \$4,000,000). Pop. (1901) 142,142.

CAROLINE MATILDA, Queen of Denmark; sister of George III. of England: see **STRUENSEE**, **JOHANN FRIEDRICH**.

CAROLITIC. a. *kār'ō-līt'ik* [L. *corolla*, a garland, a chaplet]: in *arch.*, adorned with festoons or foliage.

CAROLUS-DURAN, **EMILE AUGUSTE**: 1837, July 4 — — — — —; b. Lille, France. French painter. He studied in Paris (1853-61); in 1861, went to Rome, and later to Spain. *L'Assassine* (1866) procured him his first medal. In 1878, he exhibited his design, *Gloria Marie Medicis*, for a ceiling in the Luxembourg. *The Evening Prayer* was painted in 1863. He is famed for portraits of great faithfulness and power. Among these are a portrait of Emile Gerardin, an equestrian portrait of Mlle. Croizette, and a number of portraits of his own children.

CAROTID ARTERY, *ka-rot'id*: the great artery of the neck which on each side distributes blood to the different parts of the head, appears to have derived its name either from Gr. *kara*, the head, or, more probably, from Gr. *karos*, sleep, there being an old idea, which the re-

searches of Dr. Alexander Fleming have shown to be correct, that there was some connection between deep sleep and compression of these vessels.

Each C. A. consists of the primitive or common carotid, which, at the upper margin of the larynx or organ of voice, separates into two great divisions, of nearly equal size—the external and the internal carotid. The external carotid supplies the larynx, tongue, face, and scalp with blood, its principal branches being the superior thyroid, the lingual, the facial, the occipital, the posterior aural, the internal maxillary, and the temporal. The last-named artery is occasionally opened by the surgeon in preference to a vein, as, for example, in certain cases of cerebral apoplexy. The internal carotid enters the cavity of the cranium through a somewhat tortuous canal in the temporal bone, and after perforating the dura mater, or fibrous membrane of the brain, separates into the anterior and middle cerebral arteries, which are the principal arteries of the brain; while in its course through the dura mater, it gives off the ophthalmic artery, which subdivides into several small branches that supply the eye and surrounding parts. See CIRCULATION.

Surgery.—Wounds of the carotid trunks are generally from stabs. Suicides have a vague desire to cut them, but rarely cut sufficiently deep by the side of the windpipe. Of course, should either vessel be wounded, death results almost immediately. Punctured wounds, however, may not be immediately fatal; they may heal, or a false aneurism (q. v.) may result.

Sir Astley Cooper was the first to tie the common carotid for spontaneous aneurism, in 1805, Nov.; and the operation has been successfully performed in a number of cases since. Owing to the numerous interchange of branches between vessels of both sides of the head, cutting off the supply of blood through one carotid is seldom followed by affections of the brain. Such have, however, occurred in a few instances; but Dr. Mussey, of America, tied both carotids within twelve days of each other without any such result.

The common carotid in the horse is the termination of the right arteria innominata. It is a large vessel, about an inch long, which emerges from the chest below the windpipe, and divides into the *right* and *left* carotids. These bend upward, having the windpipe between them, gradually inclining inward at the upper part, where each divides into external and internal carotid, and a large anastomosing branch arising from between these two.

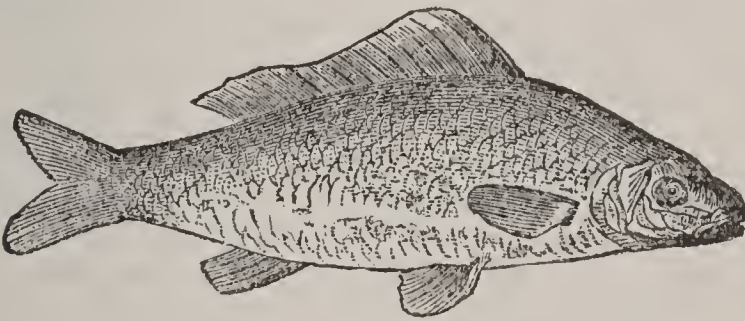
CAROUGE, *kâ-rôzh'*: town of Switzerland, canton of Geneva, about two m. from the city of Geneva, with which it is connected by a bridge across the Arve. C. is beautifully situated, regularly built, and surrounded by villas, orchards, and meadows. It has a handsome Rom. Cath. church. There are cotton-spinning, leather, and pottery manufactures; and in 1780 the king of Sardinia, as ruler of Savoy, tried to set it up as the industrial rival of Geneva, but failed. Pop. (1880) 5,889; (1888) 5,703.

CAROUSE—CARP.

CAROUSE, v. *kă-rowz'* [Ger. *gar aus*, all out: Sp. *car. auz* or *caraos*, act of drinking a full bumper to one's health]: to drink hard; to revel: N. a drinking-match; a revel. **CAROUSING**, imp. *kă-row'zing*. **CAROUSED'**, pp. *-rowzd'*. **CAROU'SER**, n. *-zër*, one who. **CAROU'SINGLY**, ad. *-lĭ*. **CAROU'SAL**, n. *-zăl* [F. *carrousel*, a tilt, a carousal]: a feast or banquet; revelry. *Note*.—In F. the *carrousel*—from It. *carosello* or *garosello*, was the tilt or tournament, and the amusements and revelries connected therewith, and seems to have been adopted into English in the sense of 'feasting and revelries' only; *carouse*, as may be seen from the text, is really from a different root: comp. Gael. *craos*, a large mouth, *craosach*, deep-drinking.

CARP, v. *kârp* [Icel. *karpa*, to boast: prov. Sw. *karpa*, to brag: L. *carpĕrĕ*, to pluck: Port. *carpire*, to cry or weep]: to snatch or catch at; to find fault, generally without sufficient reason; to cavil; to censure—followed by *at*. **CARP'ING**, imp. **CARPED**, pp. *kărp't*. **CARP'INGLY**, ad. *-lĭ*. **CARP'ER**, n. one who.

CARP, n. *karp* [F. *carpe*, a carp—from mid. L. *carpa*; Ger. *karpfen*; Dut. *karper*; Icel. *karfi*], (*Cyprinus carpio*): fish of the family *Cyprinide* (q.v.), of which, indeed, it may be regarded as the type; native of central Europe, and corresponding latitudes in Asia, but on account of its value as an article of food, long naturalized in many countries in which it is not indigenous. No fish, indeed, except its congener the goldfish, has been so much transported by man from one place to another; and this has been the more easily and successfully accomplished, that the C. can subsist longer than most fishes out of the water,



Carp (Cyprinus carpio).

if only kept moist. The C. is said not to be originally a native of England, but the statements sometimes made as to the time of its introduction are untrustworthy; it certainly existed in England before the 16th c. It is mentioned in the famous Boke of St. Albans, 1496, by Dame Juliana Barnes, as a 'dayntous fysshe, but scarce.' The C. spawns in May, and is out of condition until July. It does not thrive so well in Scotland, of which country it is certainly not a native, as in the south of England; and in northern countries generally, it neither increases so rapidly in size, nor has so great fecundity, as in more congenial climates. Its fecundity, in favorable circumstances, is prodigious; more than 700,000 eggs have been found in the ovaries of a single C. of moderate size. The C. is an in-

CARPACCIO—CARPAL.

habitant of lakes and ponds rather than of rivers, in which, if it is found, it shows a preference for the stillest parts. It feeds chiefly on aquatic plants, and may be fattened on lettuces and similar soft vegetables, for which its teeth are remarkably adapted, being few, mostly large, flat, and situated on the pharynx very far back in the mouth; worms, mollusks, and insects, however, form part of its food. It deposits its spawn on weeds. It is said to live to a great age, even 150 or 200 years, its scales, 'like the productions of the cuticle in some other animals, becoming gray and white with age.' It is known to attain the weight of 3 lbs. when six years old. A C. of 18 or 19 lbs. weight is deemed of extraordinary size in England, but one of 70 lbs. weight, and nearly 9 ft. long, was taken near Frankfort-on-the Oder, and 30 or 40 lbs. is not an unusual size in some of the German lakes. In Austria and Prussia, many lakes and ponds are let at a high rent for the C. which they contain —Of the other species of the genus *Cyprinus*, as now restricted, which are found in Britain, none belong to the section having barbules at the angles of the mouth. See CRUCIAN: GIBEL: GOLDFISH.

To the angler, the C. is not a very valuable fish, as it is by no means a free biter. When hooked, however, the C. runs strongly, and fights with considerable determination and cunning. In still water, the best means of fishing for C. is with a very light quill-float. A small piece of dead rush will answer the purpose equally well, or better. The float should be fixed on the line so that the bait may be *upon* the bottom, and if that be clear of weeds (the angler must select with this in view), the C. will easily see and pick up the bait. It is advisable, however, in fishing for C., to use two rods, and the float to one of these should be so placed that the bait may be just *off* the bottom. The former tackle should be baited with well-scoured red worms, gentles, or grubs of some sort; the latter with a green pea, boiled wheat, or paste. Gentles, wasp grubs, flies, and other insects, worms, or caterpillars, may all, at times, take carp. When a C. bites it nibbles at the bait for some seconds before taking it, and often takes off the tail of the worm, or strips the hook completely. But it is useless to strike until the float disappears entirely.

CARPACCIO, *kâr-pât'cho*, VITTORE: one of the most notable painters of the early Venetian school, whose work dates from the end of the 15th c. and the beginning of the 16th. He was a pupil and rival of the two Bellinis (q.v.). He had rich invention, and great power of dramatically representing action; his work is marked more by grace and harmony than by richness of color. He frequently painted subjects in series; thus there are eight pictures illustrating the life of St. Ursula (all at Venice), and five on the history of St. Stephen (at Milan, Paris, and Berlin). He was industrious and successful in his art till 1515, when his powers declined. John Ruskin has sought to awaken interest in C.'s art.

CARPAL: see under CARPUS.

CARPATHIAN MOUNTAINS—CARPEAUX.

CARPATHIAN MOUNTAINS, *kâr-pâ'thî-an*: mountains which inclose Hungary and Transylvania on the n., e., and s. in a great semicircle, extending 800 m. from Presburg on the Danube to Orsova on the same river. The C. M. form part of the great mountain system of central Europe, separated from the mountains of Silesia and Moravia by the valley of the March, and from the Alps and Mount Hæmus by the valley of the Danube. Almost the whole of the C. M. lie within the Austrian dominions. They form two great masses, one in Hungary to the n.w., and one in Transylvania to the s.e., with ranges of lower and wooded mountains between. The highest group of the Hungarian Carpathians is that of *Tatra* or the *Carpat*, in the very n. of Hungary, a majestic mass of granite mountains, exhibiting much grandeur in its naked precipices, and in some of its peaks rising to the height of more than 8,000 ft., the Lomnitz peak being 8,133 ft. high. On the n. declivity of the Eisthal peak is the only glacier in the Carpathians. The Tatra group is penetrated by no valleys, but only by wild ravines, and is separated from the rest of the range by deep depressions. There is a great difference of climate between its s. and n. sides. These higher mountains yield few minerals, but the lower Carpathians of Hungary, which stretch around them in groups and ranges, abound in minerals of various kinds. The mines of Schemnitz (q.v.) are of great celebrity. Many of the Hungarian mountains are of limestone. The mountains of Transylvania are mostly of primitive rocks. On the e. and s. borders, they reach the height of 9,000 ft. and upward. Mount Butschetje, the culminating peak, has an elevation of 9,528 ft. above the sea. The C. M. are generally clothed with wood to a height of more than 4,000 ft.—in some parts forests are found at 5,500 ft.—and with steep precipices, narrow ravines, extinct craters, and cones of volcanic origin, they exhibit scenes of grandeur rarely exceeded. The lower parts of the mountains are beautifully clothed with vineyards, walnut groves, etc., above which ascend forests of cherry, beech, and pine. The ranges which connect the high mountains of Hungary with those of Transylvania are in great part composed of sandstone, have an unfruitful soil, and comparatively little population or cultivation.

CARPATHOS: see SCARPANTO.

CARPEAUX, *kâr-pô'*, JEAN BAPTISTE: 1827, May 14—1875, Oct. 23; b. Valenciennes; sculptor. He studied in Paris, and gained the prize of Rome, 1854; his first notable statue, a fisher boy, was produced in 1859. The group of Ugolino and his children was purchased by the French govt. 1863, and drew attention by its bold departure from classical models. He designed for the Louvre, 1865, figures showing the French empire enlightening the world and protecting agriculture and science. His work *La Danse*, on the façade of the new opera house, 1869, was much praised and equally blamed; soon after it appeared an attempt was made, Aug. 27, to injure it with corrosive

CARPEL—CARPENTER.

ink. Among his other chief works are a Neapolitan fisherman, in Baron Rothschild's College, and a girl with a shell, owned by the Duchess de Mouchy. C. was a leading representative of the naturalistic school.

CARPEL, n. *kâr'pěl* [Gr. *karpos*, fruit]: in *botany*, a modified leaf forming the whole or part of the pistil of a flower. The number of ovaries and stigmas in the pistil depends on the number of carpels of which it is composed; but sometimes several are so intimately united that they appear as one. It is the upper surface of the leaf which forms the inner surface of the carpel. At its margins, the ovules are developed, like the buds formed on true leaves of some kinds of plants. The fruit, as well as the pistil, may therefore be said to be composed of one or more carpels. **CARPELLARY**, a. *-pěl'ler-ĭ*, pertaining to a carpel.

CARPENTARIA, *kâr-pěn-tâ'ri-a*, **GULF OF**: broad and deep indentation of the n. coast of Australia, stretching from 11° to 17° 30' s. lat. and from 136° to 142° e. long. It is said to have been named from Carpenter, a Dutchman, who discovered and partly explored it 1627. The Gulf of C. contains many islands. The shores of the mainland are generally low; and, in the rainy season, the floods are such as materially to freshen the sea.

CARPENTER, n. *kâr-pěn-tēr* [OF. *carpentier*; F. *charpentier*, a worker in timber—from L. *carpentāriŭs*, pertaining to a chariot, a wheelwright—from *carpen'tum*, a carriage, a chariot: comp. Gael. *carbħ*, a plank, a ship]: a man who works in timber; a builder or framer in wood, as in houses and ships; a wright. **SHIP'S CARPENTER**, in the navy, one whose duty is to keep a ship of war in repair, specially during a battle, in case of damage that may endanger sinking. **CAR'PENTRY**, n. *-trĭ*, the art of framing and joining timber in the construction of buildings. **CARPENTER'S-RULE**, the instrument by which carpenters take their dimensions, and by the aid of a brass slide, which makes it a sliding-rule, they are enabled to make calculations in multiplication and division, beside other operations. **CARPENTER'S-SQUARE**, an instrument whose stock and blade consists of an iron plate of one piece. The larger leg is eighteen inches long, and numbered on the outer edge from the exterior angle with the lower part of the figures adjacent to the interior edge. The other leg, which is 12 inches long, is numbered from the extremity toward the angle, the figures being read from the internal angle as on the other side. This instrument is used not only as a square, but also as a level and measuring rule. *Note.*—A *carpenter* means properly one who does the larger and coarser work, and the *joiner* the finer.

CARPENTER.

CARPENTER, CHARLES CARROLL: an American naval officer; 1834, Feb. 27—1899, April 1; b. in Greenfield, Mass.; was promoted commodore 1893, rear-admiral 1894. He was commander-in-chief of the U. S. Asiatic Squadron 1894-95; rendered valuable service in China during the summer of 1895 in protecting the American missionaries and in co-operating with U. S. Minister Charles Denby and the British and Chinese authorities to preserve peace.

CARPENTER, FRANCIS BICKNELL: an American painter, 1830, Aug. 6—1900, May 23; b. in Homer, N. Y.; studied with Sanford Thayer and became an associate of the National Academy. He painted portraits of Presidents Pierce, Fillmore and Lincoln, William H. Seward, Charles Sumner, Henry Ward Beecher, Horace Greeley and John C. Fremont. His best known painting is the large historical picture representing President Lincoln signing the Emancipation Proclamation. He wrote *Six Months in the White House with Abraham Lincoln*.

CARPENTER, GILBERT SALTONSTALL: an American military officer; b. 1836, April 7; served in the Union army 1861-65. In recognition of his gallantry at El Caney, Cuba, 1898, during the war with Spain, he was commissioned a brigadier-general of volunteers; was promoted colonel of the 18th U. S. Infantry 1899, June 20; and brig.-gen. 1899, Dec. 5; and on the 26th of the same month was retired at his own request after 30 years of service.

CARPENTER, LOUIS G.: an American engineer; b. 1861, March 28; was graduated at Michigan Agricultural College 1879, and served as instructor of Mathematics there; became Prof. of Engineering at the Colorado Agricultural College, and meteorologist and irrigation engineer at the Agricultural Experiment Station 1888. Shortly afterward he organized the first course in irrigation given in any American college. In 1891 he established the American Society of Irrigation Engineers.

CARPENTER, LOUIS H.: an American military officer; b. 1839, Feb. 11; served in the civil war; was aide to Gen. Sheridan, and was commissioned colonel of volunteers, 1865. He subsequently served in various Indian campaigns. In 1897 he was made colonel of the 5th U. S. Cavalry, and 1898 brig.-gen. of volunteers. For gallantry during the Spanish-American war, and especially as commander of the Department of Porto Principe, Cuba, he was made Brig.-Gen. U. S. A., 1899, Oct. 18, and was retired on the following day.

CARPENTER, MARY: philanthropist: 1807-77; dau. of a Unitarian minister of Bristol, and sister of Dr. William B. Carpenter. She was active in the movement for the reformation of neglected children, and, besides advocating their cause in her writings, she founded several reformatories for girls, one of which, the Red-hedge Reformatory, she superintended. In her philan-

CARPENTER.

thropic labors she visited India three times, and in 1871 instituted the National Indian Assoc., whose journal she edited. Besides her reformatory writings she published *Our Convicts* (1864), a book which drew public attention to the treatment of young criminals; *The Last Days of the Rajah Rammohun Roy*; and *Six Months in India*. See *Mary Carpenter*, by J. E. Carpenter (1879).

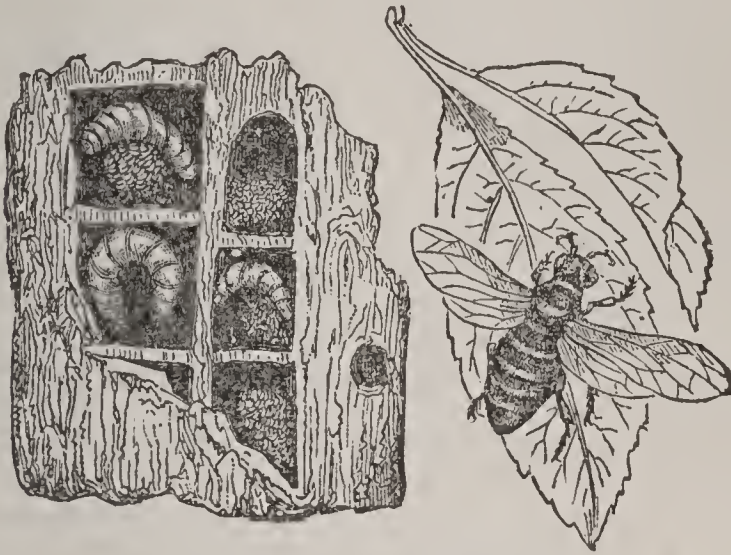
CARPENTER, MATTHEW HALE: lawyer and U. S. senator: 1824, Dec. 22—1881, Feb. 21; b. Moretown, Vt. He entered the U. S. Mil. Acad. 1843, remained there two years, then studied law with Rufus Choate, was admitted to the bar, and removed to Milwaukee, Wis. to practice 1848. He was elected U. S. senator as a republican to succeed James R. Doolittle, and served 1869, Mar. 4—1875, Mar. 3; re-elected to succeed Timothy O. Howe, and served from 1879, Mar. 18, till his death. He was eminent in the practice of his profession and in the councils of his party, and one of the most striking figures of the 'reconstruction' period.

CARPENTER, WILLIAM BENJAMIN, C.B., M.D., LL.D., F.R.S., F.L.S., F.G.S.: physiologist and naturalist: 1813—1885, Nov. 10; b. Exeter: son of a Unitarian minister. In 1839, the year of his graduation in Edinburgh, he published *Principles of General and Comparative Physiology*, one of the earliest works giving a general view of the science of life. As the treatise grew in size in successive editions, it was divided into two—*The Principles of Comparative Physiology*, and *The Principles of General Physiology*. These works, together with *The Principles of Human Physiology* (1846, 9th ed. 1882), and *The Principles of Mental Physiology* (1874), form a complete cyclopedia of biological science. C. likewise published *A Manual of Physiology*; *The Microscope, its Revelations and its Uses* (6th ed. 1881); *Physiology of Temperance and Total Abstinence*; and numerous memoirs on various departments of physiology, microscopical anatomy, and natural history, in the *Philosophical Transactions*, etc. His most important original researches are *On the Structure of Shells*; *On the Development of Purpura Lapillus*; and *On the Structure, Functions, and General History of the Foraminifera*. For several years he edited *The British and Foreign Medico-Chirurgical Review*, and he was one of the editors of *The Natural History Review*. In 1849, he was appointed prof. of medical jurisprudence at Univ. College; soon afterward examiner in physiology and comparative anatomy in the Univ. of London, and in 1856 registrar to that univ., which office he held till 1879. In 1861, the royal medal was awarded to him by the Royal Soc.; in 1883, the Lyell medal by the Geological Soc.; and in 1873, he was elected a corresponding member of the Institute of France. He took a chief part in the government expeditions sent out in 1868, '69, '70 for deep-sea exploration in the n. Atlantic; and afterward he contributed largely to the discussion of the vexed question of ocean-circulation in the *Journal of the Royal Geographical Soc.* and other periodicals. For a summary of his views, see *Enc. Brit.* 9th ed. ATLANTIC.

CARPENTER BEE—CARPENTRAS.

He advocated the doctrine of a *vertical circulation* sustained by opposition of temperature only, independent of and distinct from the *horizontal* currents produced by winds: see GULF STREAM. This doctrine was first advanced by Professor Lenz of St. Petersburg 1845; but Dr. C. was ignorant of this, when the deep-sea observations, begun in 1868, led him to an identical theory. Dr. C. wrote largely against spiritualism. He entered this field as early as 1853, in an article on animal magnetism in the *Quarterly Review*; and in 1877 published *Mesmerism and Spiritualism*. He died in London from the results of an accident.

CARPENTER BEE: one of those bees that excavate



Carpenter Bee (*Xylocopa*):

Showing the Cells for Eggs and Larvæ, excavated in dead-wood. their nests in wood. For the species *Xylocopa violacea*, see BEE.

CARPENTRAS, *kâr-pông-trás'*: town of France, dept. of Vaucluse; on the left bank of the Auzon, about 15 m. n.e. of Avignon. This town was known to the Romans as *Carpentoracte*, and, among other remains, a triumphal arch attests their former presence. C. has manufactures of cottons, woolens, and leather; brandy distilleries, dye-works, etc. It is the entrepôt for the products of the district. Pop. 7,500.

CARPENTRY.

CARPENTRY : art of framing timber for architectural and other purposes. Technically, the term is restricted to the framing of heavy work, such as the roofs, floorings, partitions, and all the wood-work concerned in maintaining the stability of an edifice, while the minor and ornamental fittings are called joinery ; but, popularly, the workman who does either kind of work is called a carpenter.

The preliminary preparation of timber is the work of the sawyer, who, by the saw-mill or pit-saw, divides the trunks of trees into planks, etc. ; these are further divided by the carpenter, who uses hand-saws of various kinds, according to the work. For dividing wood into separate pieces in the direction of the fibre, the *ripping-saw* is used ; for cross cutting, or sawing thin pieces in the direction of their length, the common *hand-saw* or the finer toothed *panel-saw* ; for making an incision of a given depth, and for cutting small pieces across the fibre, the *tenon saw*, the *sash-saw*, or *dovetail-saw* is used. These are thin saws, stiffened by a strong piece of metal at the back to prevent crippling. When a curved cut is to be made, a very narrow saw without a back, called a *compass-saw* or a *keyhole-saw*, is used. The general name for these is *turning-saws* ; they have their plates thin and narrow toward the bottom, and each succeeding tooth finer, and the teeth are not bent on contrary sides of the plate for clearing, as in broad saws.

The surface of wood is smoothed by planing. According to the work, different kinds of planes are used: the *jack-plane*, large and rough, for taking away the rough of the saw ; the *trying-plane*, for bringing the surface perfectly level and true, or the *long-plane* for the same purpose, where the work is of great length, as for the joining edges of long boards to be glued together. The *smoothing-plane*, much smaller than these, gives the smooth finished surface. The *spoke-shave*, a sort of plane with a double handle, is used for paring and smoothing rounded work.

Ornamental moldings are cut by means of molding-planes, which have their cutting edges curved to the required pattern. A good stock of these is one of the most expensive items of the tool-chest.

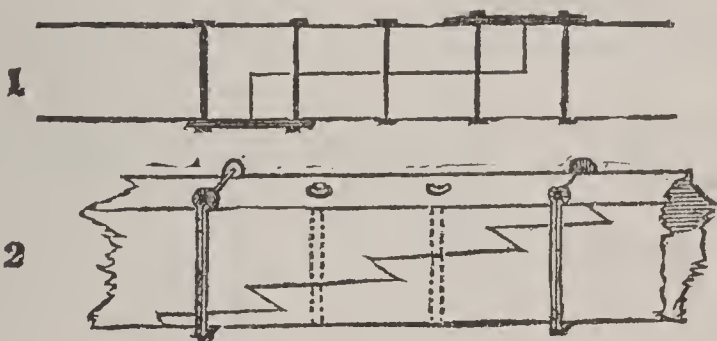
The paring of wood, and the cutting of rectangular or prismatic cavities, notches, etc., are done by means of *chisels*. Those for cutting across the fibre are called *firmers* or *paring-chisels* ; those for cutting deep and narrow cavities, *mortise-chisels*, which are made very thick and narrow and fitted in the handles with a strong flange, to bear heavy blows with the mallet. Chisels for paring concave surfaces are called *gouges*. For boring holes, *brad-awls*, *gimlets*, *centre-bits*, and *gouges* are used—the two latter, fixed in a *stock* or revolving handle, are used for large holes. When it is required to ascertain if an angle be square, or of any given inclination, the *square* or the *bevel*, set to the required angle, is applied to test the work as it proceeds. When parallel edges are required, the *marking gauge* is used to draw the line to be worked to. When a simple straight line is re-

CARPENTRY.

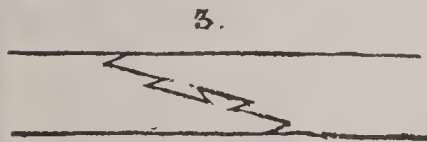
quired for working to, a piece of string is chalked, then stretched tightly over the wood and lifted in the middle, when, by its recoil, it strikes the wood and leaves a straight chalked line. The *straight-edge*, a strip of wood with one of its edges perfectly straight, is applied to detect superficial irregularities. The operation of planing the edge of a board straight is called *shooting*, and such edges are said to be *shot*. When the joiner requires to ascertain whether the surface of a piece of wood is all in one plane, he takes two slips of wood with edges perfectly straight and parallel, and of equal width; these slips, called *winding-sticks*, are placed edge upward, one at each end, across the board, and the workman looks in the longitudinal direction of the board over the upper edges, and if the two edges be not in the same plane the board is planed down at the elevated parts until it is *out of wind*. For setting work level, a spirit-level, set in a wooden frame, or a plumb-level is used. For further description of the tools alluded to above, and in the rest of this article, see the special titles.

When two pieces of timber have to be united at their ends, as in lengthening the beams for roofing, partitions, the masts and keels of ships, etc., the operation is called *scarfing*, and the joint a *scarf*. The methods of scarfing are very numerous; those figured below will serve to illustrate the principal.

Fig. 1 is a section showing the common or single step scarf, with plates, and the bolts passing through. Fig. 2



is the French scarf, called *traits de Jupiter*, or Jupiter's lightnings, with the straps and bolts shown. In these the scarf itself gives no resistance to the longitudinal strain. Fig. 3 shows a scarf in which the resistance of the wood to splitting is made available.



The following are the principal rules for scarfing as stated by Tredgold.

The length of the scarf should be, if bolts are not used—in oak, ash, or elm, six times the depth of the beam; in fir, twelve times the depth of the beam. If bolts and indents are combined the length of the scarf should be—in oak, ash, or elm, twice the depth of the beam; in fir, four times the depth. In scarfing beams to resist transverse strains, straps driven on tight are better than bolts. The

CARPENTRY.

sum of the areas of the bolts should not be less than one-fifth the area of the beam, when a longitudinal strain is to be borne. No joint should be used in which shrinking or expansion can tend to tear the timbers. No joint can be made so strong as the timber itself. When two pieces of timber are connected so that the joint runs parallel with the fibres of both, it is called a *longitudinal joint*; but when the place of the joint is at right angles to the fibres of both, an *abutting joint*.

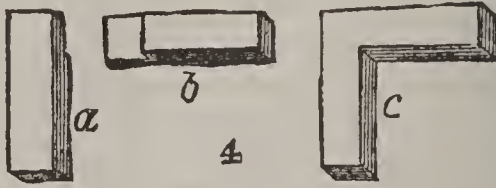
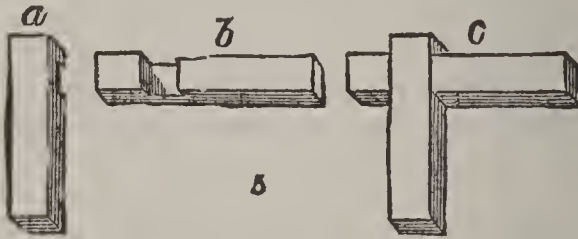
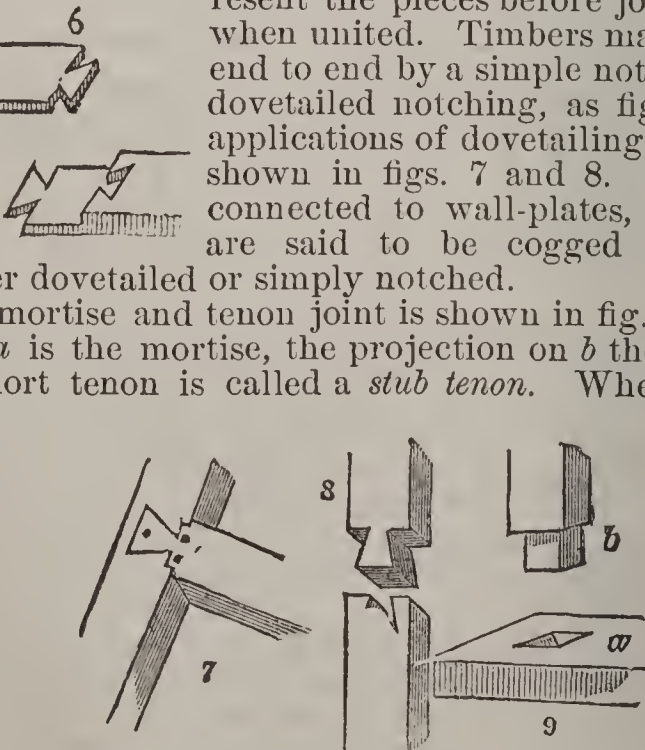


Fig. 4 is an example of common and simple joint, for connecting timbers at right or other angles. It is called



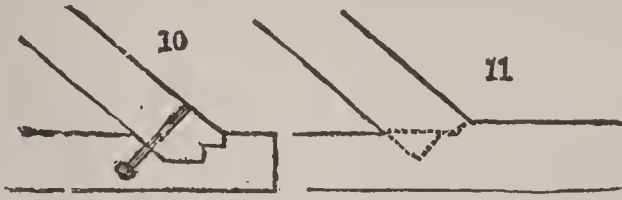
a *notched joint*, and requires bolting. Fig. 5 is a notched joint for crossing timbers. In both figures, *a* and *b* represent the pieces before joining, and *c* when united. Timbers may be joined end to end by a simple notching, or by dovetailed notching, as fig. 6. Other applications of dovetailing timbers are shown in figs. 7 and 8. Tie-beams, connected to wall-plates, as in fig. 7, are said to be cogged or cocked, whether dovetailed or simply notched.

The mortise and tenon joint is shown in fig. 9; the cavity in *a* is the mortise, the projection on *b* the tenon. A very short tenon is called a *stub tenon*. When a second



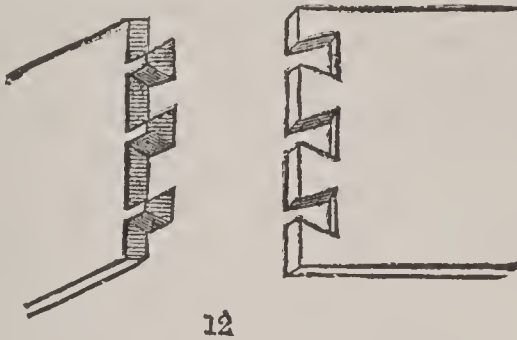
minor tenon is made projecting from the principal tenon, it is called a *tusk tenon*.

Figs. 10 and 11 show methods of framing a rafter foot into a girder.

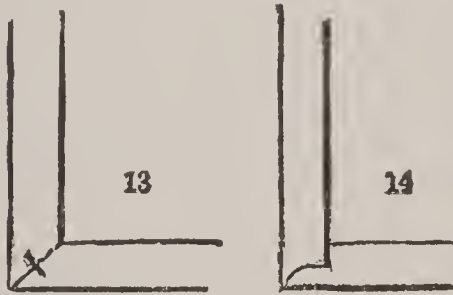


The above joints are some of those used in heavy work, or carpentry proper. For lighter joiner's work, similar methods of framing are used, only adapted to the work—to boards generally instead of beams; thus, for example, the mortise and tenon joint, made oblong instead of square, is used in framing doors, shutters, drawing-boards, or any other kind of extended superficial work liable to warping. An outside frame or skeleton is made with a panel or panels in the middle, and each piece of the frame has the grain at right angles to the piece into which it is mortised, in order that they shall eventually correct the warping.

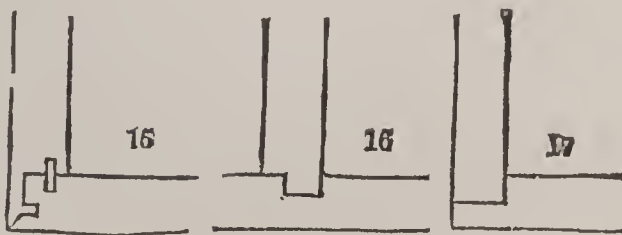
Dovetailing is extensively used for connecting boards at



right or other angles, as in making boxes, drawers, etc. The common dovetail is shown in fig. 12; the common mitre, fig.



13; the lapped mitre, fig. 14; and the lapped and tongued mitre, fig. 15.



Modes of notching for boards are shown in figs. 16, 17, and 18. Fig. 16 is called a *nosing*, also shown at fig. 21, in its

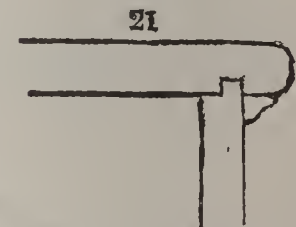
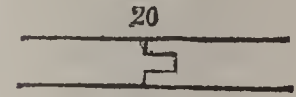
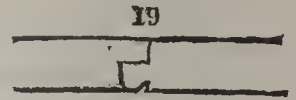
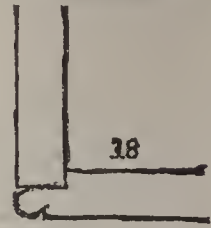
CARPENTRY.

common application for fixing the *risers* to the *treads* of stair cases. Common dovetailing is usually glued. Nails or pins and glue are used with the mitre and other notched joints.

Boards may be united at their edges to form an extended surface, as a flat plank partition, etc., either by simple gluing of the shot edges, by a *rebate* (fig. 19), or by a plowed groove and a corresponding projection. The rebate is cut by means of a rebating plane; that in the figure is combined with a bead, the usual joint for wooden partitions. The groove, fig. 20, a sort of extended mortise, is cut by a plane with a projecting iron called the *plow*.

In all cases where glue is used in joints it should be applied to both surfaces, which should be rubbed and pressed together until nearly all the glue is forced out, then kept pressed by a cramp or weights. White lead is used for outside joints.

For special departments of C. such as roofs, staircases, etc., see the respective titles.



CARPET—CARPETS.

CARPET, n. *kâr'pět* [OF. *carpite*, a carpet—from mid. L. *carpētā*, plucked wool, any quilted fabric—from L. *carpĕrĕ*, to pluck: F. *charpie*, lint: Sp. *carpeta*, a bed cover: It. *carpita*, a coarse counterpane—originally used for bed-covers and table-covers]: the woven or felted stuff made of wool, variously colored, used to cover rooms, stairs, etc.: V. to cover with a carpet. **CAR'PETING**, imp.: N. carpets in general; stuff for making carpets. **CAR'PETED**, pp. **TO BE ON THE CARPET** or **TO BE ON THE TAPIS** [F. *tapis*, a carpet]: means that a matter is under consideration. **CARPET-KNIGHT**—*lit.*, a knight not dubbed on the field; a soldier who has never known the hardships of actual service; a civilian who has received the honor of knighthood; an effeminate man who is averse to manly sports. **CARPET-BAG**, a travelling-bag made of the same materials as carpets. **CARPET-BAGGER**, term of contempt for newcomers to a region who have, or are accused of having, interests diverse from those of the old inhabitants.

CARPETS: floor-coverings, usually woven or felted. Woven C. were used first in the East, where the custom of sitting crossed-legged on the floor still renders them especially useful. Our rude European forefathers covered the floors of their houses with rushes, hair, or straw; and in Norwegian farm-houses, where many ancient customs remain, the floor of the best room is commonly strewn with juniper-twigs. The first step toward a woven carpet was made by plating rushes to form a matting.

The principal varieties of C. now in use are the Turkey, the Axminster, the Brussels, the Wilton, the Venetian, the Dutch, the Kidderminster or Scotch, Whytock's tapestry and velvet pile, and the printed felt carpet.

The real Turkey carpet is made in one piece: those manufactured for the orientals are usually too small for use in this country. The patterns consist merely of curved and angular strips of variegated but dark and unobtrusive colors. The warp is of strong linen or cotton, to which bunches or tufts of colored worsted are tied according to the pattern, a drawing of which is placed before the weaver to copy. The surface is afterward shorn level. Rugs are made in a similar manner; the colored worsteds are tied very rapidly by young girls.

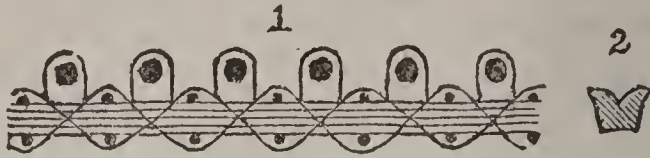
The *Axminster Carpet* is merely the English-made Turkey carpet, formerly manufactured as above at Axminster, in Devonshire. They are usually made to order, and of the size required for the room; from the tedious nature of the process of manufacture, they are very expensive.

Templeton's Patent Axminster Carpet is a very beautiful fabric, much resembling that from which it derives its name, but wrought on the chenille principle.

The *Brussels Carpet* is a mixture of linen and worsted, but, like the Turkey carpet, the worsted only is shown on the upper surface. The basis or cloth is a coarse linen fabric, and between the upper and under threads of the weft, several (usually five) worsted threads of different colors are firmly bound in. The pattern is produced by drawing to the surface, between each reticulation of the cloth basis, a

CARPETS.

portion of the worsted thread of the color required at that spot to produce the pattern; these updrawn portions are formed into loops by being turned over wires, which are af-



Carpet Weaving.

terward withdrawn, and the loops thus left standing above the basis form the figured surface of the carpet. This will be better understood by reference to the diagram, fig. 1, which is a slightly magnified section of a Brussels carpet, cut across the wires and the threads of the weft. The large dots above are the sections of the wire, the smaller dots those of the weft or shoot threads; the waved lines, the warp; the parallel lines, the five colored worsted threads; and the loops over the large dots are the updrawn worsted threads forming the surface of the carpet. The machinery and processes by which this arrangement is produced are complex, and require to be seen to be fully understood.

The *Wilton carpet* is made like the Brussels, but the wire has a groove in its upper surface, fig. 2, and instead of being drawn out, it is liberated by passing a sharp knife through the worsted loop into this groove, and thus making a velvet pile surface instead of the looped thread.

The *Venetian carpet* is produced in a common loom, and the pattern is all in the warp, which alone is visible, as it incloses the weft between its upper and under surfaces. The patterns are generally checks or stripes; the latter are used chiefly for stair carpets.

The *Dutch carpet* is a coarser and cheaper variety of plain Venetian, sometimes made wholly of hemp, or of a mixture of coarse wool and cow-hair.

The *Kidderminster* or *Scotch carpet*, often called *Ingrain*, has usually a worsted warp and woollen weft, and the pattern is made by the combination of the colors of each. Three-ply C. of this kind are the most durable of the moderate-priced C.; the patterns are not so brilliant as those of the Brussels or the tapestry, but, being ingrained and woollen throughout, they retain their character until worn through. This, and the Venetian and Dutch C., exhibit their patterns nearly similar on both sides, and are therefore reversible.

Whytock's tapestry and velvet pile carpet, as it is now frequently called, is becoming extensively used as a cheap substitute for Brussels and Wilton, which it is made to resemble very closely in the brilliancy and variety of pattern. The manufacture of this carpet is very curious and ingenious. Instead of five colored yarns, only one of which is drawn to the surface at any one place, while the other four remain buried between the upper and under threads of the cloth basis, a single colored yarn is used, and the variety of color produced by dyeing it of various colors at intervals of its length. The yarn is coiled upon a

drum, and printed by means of rollers in such a manner that when the threads that encompass the roller shall be uncoiled and laid in lines side by side, they shall present an elongated printing of the pattern, so that a rose, for example, the outline of which should be nearly circular, will be an oval, with length equal to four times its breadth. When, however, the thread is looped over the wire, four inches of yarn being used for an inch of the carpet pattern, this elongation is exactly compensated, and the rose appears in its proper proportions. The machinery required for this is, of course, much simpler than that for the Brussels, only one yarn having to be looped, and that always in the same manner.

The *printed felt C.* are, as the name implies, simply made by printing colors on felt. These are used chiefly for bedroom carpets.

A very beautiful fabric has also been introduced, called the *patent wool mosaic*, formed by cementing a velvet pile upon plain cloth. It is used for rugs, etc. The pile is formed by stretching lengths of woollen yarn between plates of finely perforated zinc, placed several yards apart, the colors of the threads being arranged so that their ends shall show the pattern. The mass of yarn is then inclosed in a case, open at both ends, and compressed without deranging the fibres; and by means of a piston or ram at one end, a portion of this mass of yarn is forced forward, the ends thus projecting are glued to the plain cloth, and when dried, are cut off to the length required for the pile. In this manner, several hundred slices are made from one setting of the yarn mosaic, and as many rugs produced.

CARPI, *kâr'pê*: town of n. Italy, 10 m. n. of the city of Modena. It is surrounded by walls, defended by a citadel, has a cathedral, and manufactures of silk and straw hats. Pop. 6,000.

CARPI: town of Venetia, province of Verona, 28 m. s.e. of Verona, celebrated for the victory of Prince Eugene over the French 1701. Pop. 1,500.

CARPI, *kâr'pê*, GIROLAMO DA: 1501–56; b. Ferrara: painter. He was a pupil of Garofalo, but conceived a vehement admiration for the works of Correggio, which he copied at Parma, Modena, etc., till his style was a perfect imitation of that master's. He sold his own paintings for Correggio's, and some now ascribed to the latter are probably C's. His best are a *Descent of the Holy Spirit* in the Church of St. Francis at Rovigi; a *St. George* and a *St. Jerome* at Ferrara; and a *Madonna*, an *Adoration of the Magi*, and a *St. Catherine*, at Bologna.

CARPINI, *kâr-pê'nê*, JOHANNES DE PLANO: Franciscan monk: b. Capitanata, Naples, about 1210: one of the six friars selected by Pope Innocent IV. to proceed to the court of the emperor of the Mongols, whose warlike advances in 1246 threw Christendom into consternation, in order to pacify the terrible nomadic warriors, and, if possible, convert them to Christianity. The mission, accomplished under dreadful hardships, though without results so far as its **main**

objects were concerned, was nevertheless far from unfruitful. Prior to this, the most monstrous fables had prevailed regarding the Tatars; and C.'s narrative, which gave a truthful and striking picture of their numbers, character, and civilization, was the first to bring these myths into discredit. In this book he also argued, with great good sense, for a union among Christian princes, as the only means of resisting those fierce hordes in their progress westward. As a book of travels, its accuracy has been attested by modern travellers. Hakluyt copied most of this work, at second-hand, into his first volume of *Navigations and Discoveries*. The date of C.'s death is not known.

CARPINO, *kâr-pē'no*: town of s. Italy, province of Foggia, 22 m. n.e. of San Severo. Pop. about 6,000.

CARPOCLONIUM, n. *kâr'pō-klō'nĭ-ŭm* [Gr. *karpos*, fruit; *klōnĭōn*, a small branch or shoot]: in *bot.*, the free spore case of certain Algæ.

CARPOCRATES, *kâr-pōk'ra-tēz*, or CARPOCRAS, *kâr-pōkrās*: philosopher: lived under Hadrian (A.D. 130) at Alexandria, where he founded the Gnostic sect of Carpocratians. According to him, the essence of true religion consisted in the union of the soul with the Monas or highest God, by means of contemplation, which elevated it above the superstitions of the popular faith, and liberated it from submission to the common laws of society. He only is to be reckoned wise who attains to this. Among those who have done so, are Jesus, Pythagoras, Plato, and Aristotle. The cosmogony of C. was of the usual Gnostic character, the central peculiarity of which was the belief that the worlds were created by angels. C. also held the doctrine of the transmigration of souls. His followers existed down to the 6th c. Whether or not they were guilty of the abominations ascribed to them, is more than can be affirmed; our only information concerning them being derived from *orthodox* writers of those times, who were in the habit of slandering heretics.

CARPOGONIUM, n. *kâr'pō-gō'nĭ-ŭm* [Gr. *karpos*, fruit; *gon'eus*, procreator, parent]: in *bot.*, in certain fungi, the twisted end of a branch of mycelium, forming the female organ.

CARPOLITES, n. plu. *kâr'pō-līts*, or CARPOLITHES, *-lithēz* [Gr. *karpos*, fruit; *lithos*, a stone]: in *geol.*, generic term applied to fossil fruits, which, in the present state of our knowledge, it is impossible to refer more precisely to their place in the vegetable kingdom. Of 100 species described, 70 belong to the Carboniferous system.

CARPOLOGY, n. *kâr-pōl'ō-jĭ* [Gr. *karpos*, fruit; *logos*, discourse]: the part of botany which treats of the structure of fruits and seeds; a treatise on fruit. CARPOL'OGIST, n. *-jĭst*, one who.

CARPOPHAGA, n. plu. *kâr-pōf'ă-gă* [Gr. *karpos*, fruit; *phago*, I eat]: fruit-eating animals, a section of the Marsupialia. CARPOPHAGOUS, a. *kâr-pōf'ă-gŭs*, living on fruits.

CARPOPHORE—CARRAGEEN.

CARPOPHORE, n. *kár'pō-fōr* [Gr. *karpos*, fruit; *phorēō*, I carry or bear]: in bot., a stalk raising the pistil above the whorl of the stamens, as in the caper; the same as *gynophore*.

CARPUS, n. *kár'pūs* [Gr. *karpos*, the wrist]: the small bones forming the wrist, consisting in man of eight small bones arranged in two rows. **CARPAL**, a. *kár'pāl*, belonging to the wrist: see **HAND**: **FOOT**: **SKELETON**.

CARPZOV, *kárp tsōf*. **JOHANN GOTLOB**: 1679–1757; son of Johann Benedict C. (1607–57), prof. of theology at Leipzig: of a family distinguished in law, diplomacy, linguistics, and theology; descended from Simon C., burgomaster of Brandenburg, middle of 16th c. Johann Gotlob C. was a theologian and prof. of languages at Leipzig, author of an introduction to the canonical books of the Old Test., also a *Critica Sacra Veteris Testamenti*.

His nephew, **JOHANN BENEDICT C.**, 1720–1803; was prof. of philosophy at Leipzig, and of poetry, Greek, and theology at Helmstadt.

CARQUINEZ, or **KARQUENAS**, *kár-k'wēs*: strait in Cal., with a length of 7 m., between Suisun Bay and San Pablo Bay.

CARR, Sir **ROBERT**: d. 1667, June 1; of Ithall, Northumberland, England. Charles II. sent him to New England 1664, as one of four British commissioners. He and Nicholls took New Amsterdam from the Dutch 1664, Aug. 27, and called it New York in honor of the duke, afterward James II. C. forced the Swedes and Dutch on the Delaware to capitulate Oct. 1, and returned to his duties at Boston 1665, Feb. He died at Bristol, England.

CARRACA, *kár-rák ká*, LA: town of Andalusia, Spain, one of the chief naval arsenals of the kingdom; 4 m. e. s. e. of Cadiz. It has been completely isolated from the mainland by artificial means; and so low is its situation that it was necessary to erect the buildings on piles. It is defended by four forts, and is altogether very complete as an arsenal.

CARRACCI: see **CARACCI**.

CARRACK, n. *kár'ák* [OF. *carraque*—from mid. L. *carricā*, a ship of burden—from L. *carrus*, a car]: in OE., a ship of burden.

CARRAGEEN, or **CARAGEEN**, n. *kár-ra-gīn'*, or **CARRIGEEN'** [Ir.], often incorrectly called C. Moss, or **IRISH Moss**: a sea-weed (nat. ord. *Algæ*: sub-order, *Ceramiceæ*), or rather several species of sea-weed, now used to a considerable extent both medicinally and as food. The use of these sea weeds appears to have been entirely confined to the peasantry of the coasts of Ireland, until about 30 years since. They are found also on the rocky sea-shores of most parts of Europe, and of the e. coasts of N. America. The species which principally constitutes the C. of commerce is *Chondrus crispus*, of which the varieties are remarkably numerous. It is 2–12 inches long, branched by repeated forking, cartilaginous, flexible, reddish-brown. *C. mamillosus* also

CARRAPATO

frequently occurs. C., after being collected, is washed,



Carrageen (*Chondrus crispus*.)

bleached by exposure to the sun, dried, and packed up for the market. Its composition is as follows:

Vegetable jelly (carrageenin).....	79·1
Mucus....	9·5
Two resins.....	0·7
Ash.....	2·0
Fibre and water.....	8·7
	100·0

When treated for ten minutes with cold water, in the proportion of half an ounce of C. to three pints of water, and then boiled and strained, it yields, with or without spices, a very pleasant drink. With a larger proportion of C., a thickish liquid or *mucilage* is obtained; and on boiling down this strong decoction, and cooling, a stiff *jelly* is procured. Milk may be used, instead of water, in the various decoctions; and with the stronger one, with sugar and spices, when thrown into a mold, a kind of *blanc mange* is obtained. C. is valued for its emollient and demulcent properties, and is likely to be found useful in most of those cases in which iodine might be exhibited; but its value seems to depend not a little on its being at once nutritious, a pleasant article of food, and easy of digestion. See GELATINE. It has been much recommended in pulmonary consumption. In some parts of Ireland, C. boiled with water (mucilage) is used instead of size for mixing with the more common colors in house-painting.

CARRAPA'TO: species of Tick (q.v.), of the genus *Ixodes*, which infests dry, bushy places in the interior of Brazil, hanging in clusters of many hundreds on very slender twigs, and ready to attach itself to any quadruped or man that passes, instantly burying its beak in the skin, from which it cannot be detached without considerable force. Horses and oxen suffer much from the attacks of the C., of which in dry seasons the numbers are so great that whole herds of cattle are destroyed by the exhaustion which they produce.

CARRARA—CARRIAGE.

CARRARA, *kâr-râ'rá*: town of n. Italy, 60 m. s.w. of Modena: on the Avenza, near its mouth in the Mediterranean, and surrounded by the marble hills which have made its celebrity. Many of the principal buildings are wholly or partially built of the inferior kinds of white marble. There are upward of 70 marble quarries in the vicinity of the town, but not more than six or seven furnish the marble used for statuary. Extensive works, fitted up with English machinery for sawing the marble, have been established near the town, in which are several shops for the sale of marble ornaments. Many foreign artists have set up their studios here, in order to save the expense which the export of the marble in its rough state entails. C. has a fine collegiate church of the 13th and 15th c., with some good sculptures, and an academy of fine arts. The quarries have been worked for more than 2,000 years, and in 1882 yielded 137,088 tons of marble. Pop. (1891) 23,827.

The famous **CARRARA MARBLE** is a white saccharine limestone, valuable to the sculptor from its texture and purity. It was formerly supposed to belong to the primitive rocks, but is now known to be a limestone of the oolitic period, highly altered by plutonic action.

CARREL, *kâ-rêl'*, **ARMAND**: 1800–1836, July 24; b. Rouen: French publicist and republican leader. He was educated in the military school of St. Cyr, and after serving for some years in the army he went to Paris, and gave attention to political and historical studies. In 1830, in connection with Thiers and Mignet, he became editor of the *National*, the most spirited and able of the journals opposed to the government of Charles X. C.'s colleagues being employed by the new government, he was left to conduct the *National* himself, which he did with a spirit and a freedom such as had not been seen in France for a long time—which on more than one occasion checked the arbitrary power assumed by government, and gained for him popular admiration and esteem. Government prosecutions, of course, followed, and heavy fines were decreed against him; but these were paid by public subscription, and each conviction only made his journal more famous. C., however, dreaded revolution as much as he hated despotism, and had no sympathy with many of those who looked up to him as a leader. Provoked into a duel with Emile de Girardin, by an attack on his personal character, C. was mortally wounded. Littré and Paulin edited his *Œuvres Politiques et Littéraires* (5 vols., Paris, 1857–58).

CARRIAGE, n. *kâr'ij* [mid. L. *carrig'iŭm*, a loaded cart, a baggage-wagon—from L. *carrus*, a cart: OF. *carier*, to carry—from *car*, a cart, a car: F. *carrosse*, a conveyance with springs—from It. *carrozza*, a coach]: the act of carrying or conveying; the thing that carries; any vehicle with springs; a coach (see **COACH**: **CART**: **WAGON**); the charge or cost of conveyance of goods; behavior or conduct; deportment; in *OE.*, management; practice; baggage. **CARRIAGE-COUPING**, n., that part of a carriage which unites the fore and hind carriages, called the perch or reach. In

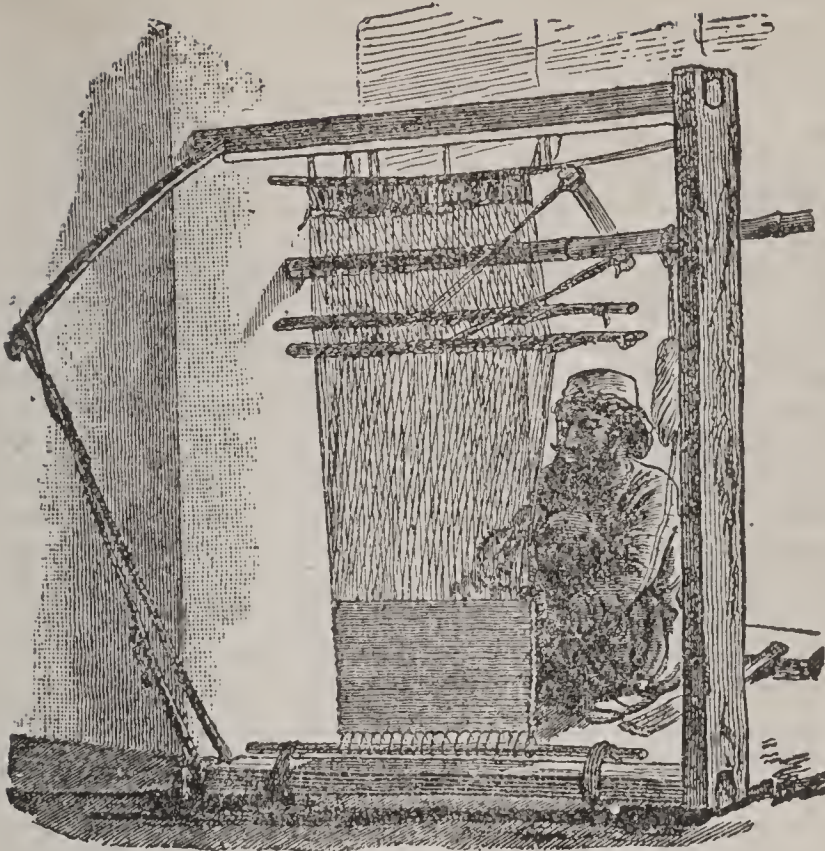
CARRIAGE DEPARTMENT—CARRICKFERGUS.

many modern carriages it is dispensed with, the bed resting on the fore and hind carriages, forming the only coupling. In wagons the coupling is a pole, whose forward end is held by the king-bolt in the fore-carriage; the hind end passes through an opening between the hind axle and bolster, and the hounds of the hind axle are fastened to the pole by a pin; *secondly*, a means of uniting the bed to the fore-carriage. It usually consists of a king-bolt, which forms the pintle on which the fore carriage turns, and the fifth wheel, which is bolted to keep the portions from bouncing apart. CARRIAGE-JACK, a lever-jack, designed to raise the axle so as to lift the carriage off the ground for the purpose of removing the wheel from the spindle for repair or greasing. CARRIAGE-TOP, the cover of a carriage—permanent in coaches; double calash in barouches and landaus; calash in some gigs, buggies, phaetons, etc.; curtained in ambulances and spring-wagons; also the shifting-rail on the back and ends of a buggy-seat.—SYN.: vehicle; coach; burden; conveyance; behavior; conduct; deportment; gait; walk.

CARRIAGE DEPARTMENT, ROYAL, at Woolwich, England: one of the great national manufacturing establishments maintained for warlike armaments—its duty being the construction of gun-carriages, for army and navy, military wagons, and vehicles of all kinds, and the joinery of the army generally. The department was organized as a distinct establishment 1803. It is under the direct control of the sec. for war, who, since 1869, administers it through the surveyor-general of the ordnance. The works, store-rooms, and yards often employ 2,000–3,000 hands. The internal communications are carried on by locomotives on a tramway of 18-inch gauge. See GUN-CARRIAGE.

CARRICAL, or KARIKAL, *kâr-rê-kâl'*: French port within the limits of Tanjore, a dist. of the presidency of Madras; lat. 10° 55' n., long. 79° 53' e., on the estuary of a small branch of the Cauvery, a tributary of the Bay of Bengal. C. is accessible from the sea only after the periodical rains, and then only for coasting craft. The town and territory contain 63 sq. m. The settlement, originally ceded to France by a native grant 1759, and subsequently subdued by the British, was restored 1814, on condition of being neither fortified nor garrisoned. Pop., town and territory, abt. 50,000.

CARRICKFERGUS, *kâr-rik-fér'gūs*: seaport town of Ireland, on the Lough of Belfast, about 10 m. from the town of Belfast. Though locally within the county of Antrim, it forms a county of itself. C. extends nearly a mile along the n.w. shore of the Lough. Its chief feature is its castle, a fine picturesque object, supposed to have been erected by De Courcy in the 12th c. It is on a rock about 30 ft. high, projecting boldly into the sea, by which it is surrounded on three sides. The ballium or keep is 90 ft. in height. From the top of the keep a splendid view is obtained, extending, in a clear atmosphere, to the



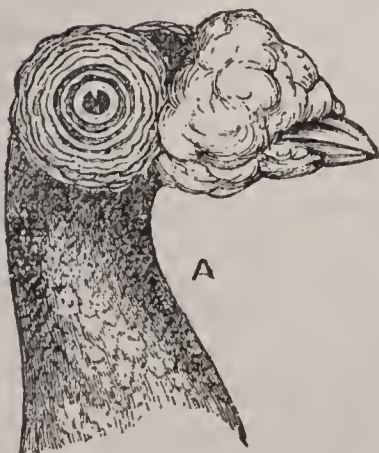
Carpet Loom, Cawnpore.



Section of Tapestry Carpet.



Section of Patent Axminster Carpet.



A



B

A, English Show Carrier Pigeon; B, Homer or Messenger Pigeon.

CARRICK-ON-SUIR—CARRIER.

Mourne Mountains and the Scotch coast. The castle contains a barrack, bomb-proof magazine, and ordnance store-rooms; and for many years 22 pieces of ordnance, 12-pounders, were mounted on the works. A total change has, however, been made in the defense of the castle, and cannon of a very large calibre are now mounted, in order to command the entrance of the Lough. In 1575, a wall 16 ft. high and 7 thick, with 7 bastions, to surround the town, was commenced, and completed in 1608; a considerable portion is still standing, and one of the four entrance-gates. In 1690, June 14, King William III. landed here with his army, 17 days before the battle of the Boyne. The rock on which the king stepped on landing is at the end of the quay, projecting from it, and still forming the landing-place. In 1760, Commodore Thurot captured the castle, but, on the approach of troops from Belfast, was forced to abandon it. The parish church, said to have been founded 1164, on the site of a pagan temple, is a fine old building, dedicated to St. Nicholas. A fine model school has been erected by the national board. There is a literary and scientific soc., with reading-room, library, and museum. The fishery of the bay, which is famous for oysters of an unusual size, employs many of the inhabitants. There are four spinning-mills, one for weaving linen, one bleaching establishment, a starch manufactory and a tan-yard. A market is held every Monday and Saturday, and a fair twice a year. There are several tumuli in the vicinity. C. is connected by railway with Belfast, Portrush, and Larne. A few years since a shaft was opened by the Marquis of Downshire, in the hope of finding coal—without success; but salt of a superior quality, and in great abundance, was found. A company has been formed and are working the mine. C. is a county of itself, abt. 5 m. square. Pop. of co. (1871) 9,397; (1881) 10,000; (1891) 8,923; of town (1881) 4,792; (1891) 4,212.

CARRICK-ON-SUIR, *kă'r'rik-ôn-shûr*: town of Tipperary, Ireland, on the Suir, which is navigable at this point, 12 m. e. of Clonmel, in the midst of very fine scenery. C. was formerly celebrated for its woollen manufacture, which has recently been considerably revived, and there are also linen and flax factories. It exports much agricultural produce. The town has recently much improved. C. became a place of note soon after the Norman conquest. There are the remains of a castle built 1309, on the site of an old priory of the Knights of St. John of Jerusalem. Pop. (1881) 6,583.

CARRICK'S FORD, *kă'r'riks fôrd*: scene of one of the minor battles of the war of secession, 1861, July 13, on Cheat river, Va. The Federal force under Gen. T. A. Morris defeated the Confederate force under Gen. R. B. Garnett.

CARRIER, n. *kă'r'rĭ-ér*: see under CARRY.

CARRIER, *kă-re-ă*, JEAN BAPTISTE: one of the most infamous members of the French national convention: 1756–1794, Dec. 16; b. at the village of Yolai, near Auril-

CARRIER PIGEON.

lac, in Haut-Auvergne. Entering the national convention 1792, he was active in the formation of the revolutionary tribunal, voted for the death of the king, demanded the arrest of the Duke of Orleans, and assisted in the overthrow of the Girondists. At Nantes, whither he was sent on a mission against the moderates, 1793, Oct., he found ample means for indulging his insatiable thirst for human blood. The utter defeat of the Vendéans had filled the prisons with captives, and C. proposed and carried a resolution for murdering the unhappy prisoners *en masse*. Accordingly, Nov. 15, he compelled 94 priests to embark in a vessel, under pretense of deportation, and during the night drowned the whole of them, by having the ship scuttled. Another of these *Noyades*, as they were called, in which 138 persons were sacrificed, took place soon after, and they were repeated to the number of 25, their perpetrators facetiously terming them 'vertical deportations.' Other cruelties C. committed here. Men and women were tied together feet and hands, and thrown into the Loire; and this was called *mariage republicain* (republican marriage). With such recklessness were these murders committed, that, in one instance, a number of foreign war-prisoners were drowned by mistake. The water of the Loire was so poisoned by corpses, that its use for drinking and cooking was prohibited. 500 political prisoners were shot, as in a battue, on the bridge near Nantes. Even Robespierre was offended by these enormities, and recalled C., who boldly justified his own conduct before the convention. The fall of Robespierre was, however, soon followed by outcries against Carrier; judgment was decreed against him, and he perished under the guillotine—dying with the protestation that, in all his cruelties, he had acted according to orders, and as a true republican patriot.

CARRIER PIGEON: variety of the domestic pigeon (q.v.), remarkable for the degree in which it possesses the instinct and power of returning from a distance to its accustomed home; therefore, much employed to convey letters from one place to another. In eastern countries, where such messengers are most frequently employed, it is the practice to bathe the pigeon's feet in vinegar to keep them cool, and to prevent it from alighting in quest of water, by which the letter might sustain injury. Pigeons intended for this use must be brought from the place to which they are to return within a short period, not exceeding a fortnight of their being let loose, and at a time when they have young in their nest, the remarkable fecundity of the C. P. affording particular facilities for its employment in this way. The bird is also kept in the dark and without food for at least eight hours before being let loose. The instinct by which it is guided, like most other instincts, has received no sufficient explanation. That it recognizes objects by sight, and so directs its course, is nothing more than a conjecture, and as such is only partially supported by the fact of the great power of vision which these birds, in common with many others, are known to possess, and by the fact that the C. P., on being

CARRIER PIGEON.

let loose, immediately rises spirally to a great height in the air, as if to obtain opportunity for the exercise of this power. The C. P. has probably been used in the Turkish dominions more than in any other part of the world, and during the siege of Paris, 1871, it safely conveyed many important messages. Its rate of flight is not less than 30 miles an hour, and it has been known to pass over great distances still more rapidly. The variety generally described as the C. P. (*Columba tabellaria* of Linnæus, *C. Turcica* of some authors, but not generally regarded by naturalists as a distinct species) is of remarkably large size, about 15 inches in length from the point of the

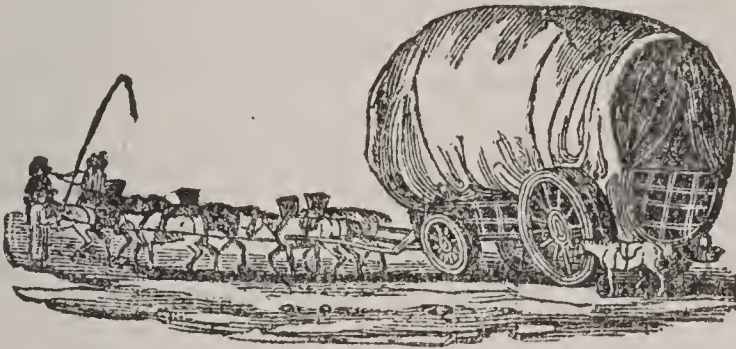


Carrier Pigeon.

bill to the extremity of the tail, and has the cere very large and carunculated, the eyes surrounded with a broad circle of naked red skin, and the wings reaching nearly to the extremity of the tail. There is, however, a smaller variety, said to be superior, which has not the carunculated cere, nor the broad circle around the eye. C. P. are trained by being conveyed, when young, to short distances of a few miles from home and then let loose, the distance being gradually increased; and this training is said to render them much more secure as messengers.

CARRIERS.

CARRIERS: class of persons who, in various forms, by land and sea, undertake the carrying of goods, particularly articles of commerce. The business is known as the **CARRYING TRADE**. The method of carrying in Arabia, Persia, and some other countries in the east has, till the present time, been chiefly by means of the camel: see **CAMEL**. In England and Scotland, previous to the general use of wheel-carriages, goods were carried on pack-horses, as is still practiced in some parts of Spain with mules: see **PACK-HORSE**: **MULE**. After the pack-horse came the one-horse cart and the four-wheeled wagon, as engines of land conveyance. Carrying with one-horse carts at the rate of about 20 m. daily, was the common practice in Scotland, and is so still in districts not traversed by railways. In connection with Edinburgh, Glasgow, and other centres of traffic, the Scotch C. travel to and from provincial towns for the most part once a week on certain days, so that their arrival at any particular place may be reckoned on with exactness. In England, the carriers' wagons are still to be seen in some rural districts. A wagon of this kind has four broad, huge wheels; and, being a heavy and clumsy engine of conveyance, is drawn



Covered English Wagon.

by four horses, though, when roads were bad in old times, six horses were not unusual. The driver ordinarily rode on a pony alongside the vehicle; now he more frequently walks, carrying a long whip. The wagon has a hooped top with movable covering, and the rear part has always been left vacant for passengers, who are necessarily huddled together on straw. Travelling in the 'tail of the wagon,' now seldom seen, was common till past the middle of the 18th c., and has afforded scope for some of the most grotesque descriptions of Fielding and Smollett. The tedious process of carriage by these wagons largely increased the prices of goods, and retarded commerce. The first modification in the carrying trade was by means of inland navigation: see **CANAL**. The chief owners of the old wagons became, in time, chief owners of the canal-boats; they paid rates or tolls to the canal companies. The celebrated English firm of Pickford & Co. has been for many generations, and still is, at the head of the goods-carrying trade.

When railways were established, a great struggle ensued; the owners of the road-wagons and canal-barges had a formidable competition. They wisely accommo-

CARRIERS.

dated themselves to a state of things which they could not prevent, and added the trade of railway goods C. to their former business. In Great Britain three systems were tried: 1. The railway company purchased road-wagons or vans, collected goods at the various towns, conveyed them by railway, and then distributed them at their several destinations. 2. The company confined their attention to the mere conveyance on their railway, leaving the collection and delivery to the ordinary carriers. 3. The company combined both systems, conveying on the railway everything that offered, and competing with the C. for the road-traffic. During the greater portion of the period in which the railway system has been in operation, the second of the above three plans has been adopted more extensively than either of the others. Taking as examples the greatest railway company and the greatest carrying firm, Messrs. Pickford had warehouses or depots at all the principal towns where the London and Northwestern railway had stations. The merchants and manufacturers were customers, not to the company, but to the firm, for the conveyance of merchandise. Messrs. Pickford employed their own wagons and horses, clerks and porters, in collecting and delivering goods, and paid to the company so much per ton for the conveyance along the railway, the toll varying according to the nature of the goods and the distance run. There were seldom any quarrels or disputes under this system. The carrier was responsible to the customer from first to last for the safety of the merchandise; and he had a claim against the company for any injury while the merchandise was on the railway. Under the third system, disputes were much more frequent.

At the present time, the tendency in Britain is for the companies to take the responsibility of the whole conveyance, the C. acting as their agents, if willing so to do, or else endeavoring to maintain a fair competition. The goods-vans traversing the streets of London and other great towns, are now more frequently inscribed with the names of railway companies than with those of private carriers. The introduction of the parcel-post system (1883) brings increase to the carrying trade.

The goods depots of the several railways are scenes of great activity during the night; for it is then that the goods arriving or departing are sorted for sending or for delivery. Canals still command a carrying trade, but chiefly in coal, stone, lime, ores, slate, bricks, and other articles bulky in proportion to value. The conveyance of manufactured goods has, for the most part, passed over to the railways.

In towns, there are C. whose business is confined wholly to short distances—a traffic which no amount of railway extension would wholly accommodate. For London an excellent system has been established by the ‘London Parcels Delivery Company.’ Two or three times a day parcels are conveyed from receiving-houses all over the metropolis to a central depot near Fetter Lane, there sorted, and sent out again for delivery. The metropolis, out to a wide distance,

CARRIERS.

is separated into districts, and one or more carts, filled with parcels, are sent to each district at certain hours of the day. The speed is rapid, the times are punctual, and the service in general well conducted.

The term CARRYING TRADE has latterly been applied more especially to all kinds of conveyance of merchandise by sea, whether across the ocean or along the coast. In this broad view, it, in reality, involves the whole question of mercantile marine, British and foreign.

CARRIERS, LAW RESPECTING. A carrier in law is one who offers to the public to convey passengers, or goods, from one place to another, for hire. The offer must be general—for a private person who contracts with another for carriage, is not a carrier in the legal sense, and does not incur the peculiar responsibilities which, in almost every country, it has been found expedient to attach to the occupation of a public or common carrier. Carriage, in law, is thus a peculiar modification of the contract of hiring. In Rome, the responsibilities of carriers by water were regulated by a pretorian edict, which was applicable also to innkeepers and stablers (*Nautæ, Caupones, Stabularii*, Dig.; lib. iv. t. 9); and from that edict the law of carriage in modern Europe has been mainly borrowed, sometimes directly, as in Scotland, sometimes indirectly, as in England. The ground on which the edict increased the responsibilities attaching to an ordinary contract of hiring was, that the persons whom it enumerated were under peculiar temptations to consort, either personally or through their servants, with thieves and robbers, without the connection being such as to admit of proof; and that the public safety consequently required that they should be held responsible for whatever had been intrusted to them, till its safe delivery at the place to which they had undertaken to convey it. This responsibility in common law extends not only to the acts of the carrier's servants, but also to those of the other guests in an inn, or the other passengers in a conveyance. The only exception to this liability at common law is in the case of loss arising from the act of God (*q.v.*) or the queen's enemies—i.e., the fury of the elements, or war. There are, however, some reasonable statutory limitations. The decisions of the courts also have somewhat limited the universal responsibility of the carrier. For example, it has been decided that he is not liable, *qua* C. (and the same applies to an innkeeper), for money taken from the pockets of the traveller; but that, if the money has been taken from the pockets of clothes which have been stolen, or from trunks which have been broken into, his responsibility comes into operation.

Under C. are included carters and porters, who offer themselves for hire, to carry goods from one part of a city to another. Whether the same be the case with hackney-coachmen is not settled; though, from the extent to which they are now employed in the transport of luggage, there seems no sound reason for an exemption in their case. Wharfingers and warehousemen are liable only under the special contracts into which they may have entered, or in

CARRIERS.

accordance with mercantile usage. In England, it has been decided that lodging-house keepers are in a different position from carriers and innkeepers, on the ground that they do not profess to entertain all comers, or to receive their goods. C. are liable to make good to the owners of goods intrusted to them all losses arising from accidental fire. Carriers have a lien upon the goods they have carried for payment of the carriage only. The lien is, however, restricted to the particular goods to which the carriage refers, and ceases on possession of them having been given up. It does not cover any account or balance due by either the sender or consignee to the carrier.

United States.—Here the definition of a carrier, or common carrier, in the meaning of the law differs but slightly from that of the English law; it describes him as one whose 'business, occupation, or regular calling it is to carry chattels for all persons who may choose to employ and remunerate him.' The occupation includes stage-coach proprietors, railway companies, truckmen, wagoners and teamsters, carmen, and porters; and express companies, whether these be local, interstate, or international (see INTERSTATE TRAFFIC). There are also included the owners and masters of every kind of vessel or water craft who undertake to carry freight for hire for the general public, and this, regardless of distance, and including lake and river, coastwise, and ocean navigation. The question has, however, been raised in law, whether carmen and coasters are common carriers, and there are arguments pro and con. The liability of the owner of a tug-boat to his tow is not that of a common carrier. Meanwhile, one who undertakes transportation only as a forwarder is considered a common carrier, and he is liable under the law.

Common carriers are responsible for all loss or damage during transportation, from whatever cause, except the act of God or the public enemy: the former case of immunity being considered to extend only to such inevitable accidents as occur without the intervention of man's agency, and which could not be avoided by the exercise of due skill and care. But the carrier is not responsible for losses occurring from natural causes, such as frost, fermentation, evaporation, natural decay of perishable articles, or the natural and necessary wear in the course of transportation, or the shipper's carelessness. Carriers, both by land and by water, are bound to carry all goods offered; and if they refuse, without just excuse, are liable to an action. But the business may be restricted within such limits as are deemed expedient, and the carrier is not bound to accept goods out of the line of his usual business, though after having received such goods, except in the case of special contract, he is liable under the general law. Live-stock is generally carried under special contract, but where this is not the case the carrier who accepts live-stock for transportation is liable under the law of a common carrier. Special contracts may be made by carriers and are binding, as to terms, time of delivery, responsibility for damage, etc., but a carrier cannot contract against his

CARRIERS.

own negligence or the negligence of his employees or agents.

Railway companies, steam-boats, and other carriers allowing express companies to carry parcels and packages on their cars, boats, or other vehicles, are liable as common carriers to the owners of goods for all loss or damage which occurs, without regard to the contract between them and such express carriers. They are responsible also to passengers for baggage intrusted to them as common carriers, such responsibility continuing for a reasonable time after the goods have been placed in the warehouse or depot of the carrier, at the place of destination, for delivery to the passenger or his order. And where one company checks baggage through a succession of lines owned by different companies, each company becomes responsible for the whole route, the baggage-check standing in the place of a bill-of lading, and being *prima facie* evidence of the liability of the company giving it. Money, however, except a reasonable amount for expenses, is not properly baggage. The responsibility of a carrier terminates after the arrival of the goods at their destination, and when a reasonable time has elapsed for the owner to receive them in business hours. Agents of corporations who are common carriers, such as railway and steam-boat companies, will bind their principals to the full extent of the business intrusted to their control, whether they follow their instructions or not. The carrier has an insurable interest in the goods that he carries, in regard both to fire and to marine disasters, measured by the extent of his liability for loss or damage. In a general way, the liability of a carrier, where the goods are not delivered through his default, is to the extent of their market value at the place of their destination. If the goods are only damaged, or not delivered in time, the owner is bound to receive them. He will be entitled to damages, but cannot repudiate the goods and recover from the carrier as for a total loss.

Common carriers of passengers are such as undertake to carry all persons, indifferently, who may apply for passage, so long as there is room and there is no legal excuse for refusing. Passengers may be excluded for cause, as being drunk and disorderly, affected with a contagious disease, or designing to commit a crime, flee from justice, gamble, or interfere with the proper regulations, and disturb the comfort of the passengers. A company owning palace and sleeping cars, who enter into no contract of carriage with the passenger, but only give him superior accommodations during the journey, is not a common carrier. Passenger carriers are not held responsible for the safety of their passengers, as common carriers of goods are, though they are bound to exercise the greatest care and watchfulness in regard to all the appliances for the conduct of their business. The fact of riding on a pass, or of not having paid fare, does not excuse the carrier for negligence. Where an injury to a passenger results directly from the passenger's own negligence, the carrier is not responsible. But, negligence being proven upon the

CARRIOLE—CARROLL.

carrier, he is responsible to passengers for loss or injury. Passenger-carriers may establish reasonable regulations in regard to the conduct of passengers, and these must be acceded to on the part of passengers. But, as has been stated, these do not extend to limitation of liability in the case of travelling on a pass; nor do the words 'good this trip only' on a ticket limit the undertaking of a company to any particular day or any specific train. There are many special regulations comprised in statutes and ordinances governing common carriers, both by land and by water, but these can be learned only through examination of the laws of the different states, the United States revised statutes, and corporation ordinances of cities and towns.

CARRIOLE: see **CARIOLE**.

CARRION, *n.* *kǎr'ri-ŏn* [OF. *caroigne* or *charoigne*, a carcass—from mid. L. *carōniā*—from L. *carnem*, flesh: It. *carogna*; F. *charogne*, carrion]: tainted or putrid flesh; flesh unfit for human food: **ADJ.** relating to; feeding upon tainted or putrid flesh. **CARRION CROW**, a species of crow common in England which feeds on carrion, insects, etc. (see **CROW**); in the United States carrion-crow or black vulture is the name not of a species of crow, but of one of the vulture family (see **VULTURE**). **CARRION-FLOWER**, a s. African plant having a fetid and very offensive odor; the blossoms of the *Stapeliā*. The genus *Stapelia* belongs to the nat. ord. *Asclepiadaceæ*, and is remarkable for excessive development of the cellular tissue of the stem and reduction of that of the leaves, resulting in a general aspect like that of the *Cactus* family. The species are natives of the Cape of Good Hope. The flowers are often large, and not devoid of beauty, but the carrion stench is very strong. It is not yet known to what chemical substance it is owing.

CARRI-WARRY, *n.* *kár'ri-wár'ri* [an imitative word]: in *Scot.* and *prov. Eng.*, a burlesque or mock serenade: see **CHARIVARI**.

CARROLL, *kǎr'ul*, **CHARLES**, OF **CARROLLTON**: 1737, Sep. 20—1832, Nov. 14: patriot: b. Annapolis, Md. His ancestors emigrated in the reign of William and Mary; the family was of Rom. Cath. faith. C. was educated at the Jesuit colleges of St. Omer, 1745–51, and Rheims, 1751–67; studied law at Bourges, Paris, and London; returned to America 1764, and married Mary Darnell 1768. He inherited the last of the Md. manorial grants, an estate valued at some two million dollars, and in 1775 was considered the richest man in America. As 'First Citizen,' he wrote, 1770–1, against the right of govt. to regulate fees by proclamation. He was a member of the first committee of observation at Annapolis 1775, and a delegate to the provincial convention. 1776, Feb., he went with other commissioners to Canada to induce a friendly attitude toward the revolted colonies. A journal of this mission, with memoir by B. Mayer, appeared 1845. The embassy returned in June with empty hands. Meanwhile the Md.

CARROLL—CARRONADE.

deputies to the continental congress had been instructed to 'disavow all design in the colonies of independence.' He hastened to Annapolis and procured the withdrawal of this order. Appointed delegate to congress July 4, he signed the Declaration with others Aug. 2. As he did so, a colleague remarked: 'There go several millions,' and added, 'but there are other Charles Carrolls, and the British will not know which it is;' whereupon C. added 'of Carrollton,' which words have kept their place as part of his name. He served on the board of war, and on the committee which drafted the Md. constitution; was elected to congress again 1777, to the Md. senate 1776, 1781, 1786, 1797, and to the United States senate 1789. He was a commissioner to settle the Va. boundary, 1799. In 1810 he retired from public life. In his 91st year, 1828, July 4, he laid the corner-stone of the Baltimore and Ohio railroad. He was greatly respected for his character, attainments, and services, and during his last six years was an object of peculiar interest as the only surviving signer of the Declaration.

CARROLL, JOHN, D.D., LL.D.: 1735, Jan. 8—1815, Dec. 3; b. Upper Marlborough, Md.: first Rom. Cath. bp. in the United States. He was educated at St. Omer's, Liege, and Bruges; was ordained priest at Liege 1769, and became a Jesuit. On the suppression of that order, he acted as its sec. in offering a remonstrance to the French court. He went to England, was travelling tutor to Lord Stourton's son 1770-73, and then prof. at Bruges. After staying with the Earl of Arundel, in England, he returned to Md. 1775, and took a parochial charge. Congress invited him, 1776, Apr. 2, to go with Franklin, S. Chase, and his cousin Charles Carroll on their Canadian mission. The Rom. Cath. clergy, desiring a hierarchy of their own after the peace, C., at Franklin's instance, was appointed vicar-gen. for America, 1786. Named bp. of Baltimore 1789, he was consecrated in England 1790, and created abp. 1815. He founded St. Mary's College, 1791, and procured a charter for Baltimore College, 1804. C. was tolerant, exemplary, and highly esteemed.

CARROLLTON: city in La., a suburb of New Orleans, with which it is connected by a horse-railroad seven m. long,

CARRON, *kār'ron*: village in Stirlingshire, Scotland. on the right bank of the Carron Water, 3 m. e.n.e. of Falkirk. Its iron-works, established 1760, are among the largest of the kind in Britain. Pop. (1881) 902; (1891) 1,088.

CARRONADE, n. *kār'rōn-ād'* [from *Carron* in Scot., where first made]: short iron gun, invented by Mr. Gascoigne. Carronades are lighter than ordinary guns, and have a chamber for powder, like mortars. They were made standard British navy guns in 1779, to be carried on the poop, forecastle, and upper works. Being manageable by a smaller number of hands than ordinary guns, and being very useful in close engagements, they were held in much favor during the great war; the seamen called them 'smash-

CARRON OIL—CARROT.

ers.' A 68-pounder carronade weighed not much more than half as much as the 42-pounder gun in use in 1779. They range from 68-pounders down to 6-pounders. For the denominations, weights, lengths, calibre, etc., of the chief varieties, see CANNON.

Some C. are made shorter with a given bore. C. are but little used, except by the English and French. Though valuable at close quarters, they are no match for long guns at a distance; and therefore a ship armed only with C. would fare badly in a general action. In recent years C. have to a considerable extent been replaced in the English navy by howitzers, long guns, and shell guns.

CARRON OIL: see BURNS.

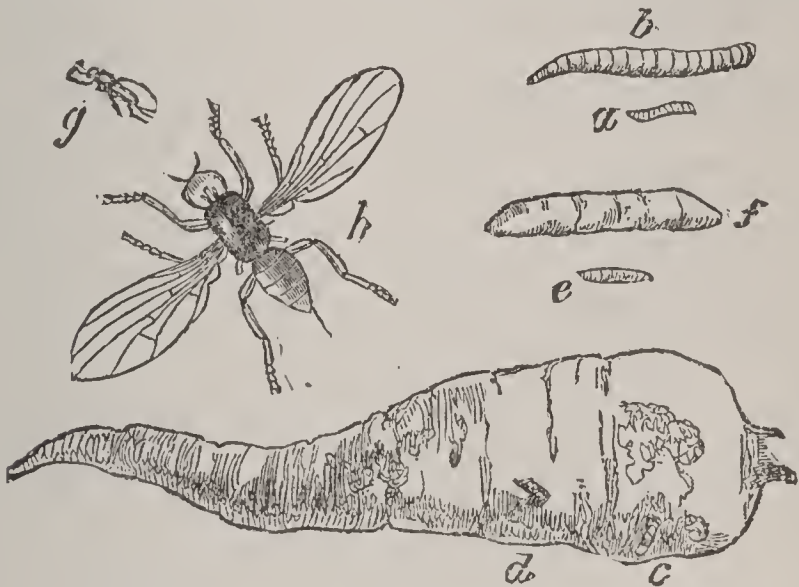
CARROT, n. *kār'rōt* [F. *carotte*—from mid. L. and It. *carota*]: a long esculent root of a reddish color. CARROT, a. *kār'rōt-ī*, like a carrot in color. Carrot (*Daucus*), is a genus of plants of the nat. ord. *Umbelliferae*; natives mostly of the countries surrounding the Mediterranean Sea. The common C. (*D. Carota*), is a biennial plant, common in the United States and in most parts of Europe, also in the Caucasus, in which countries, as also in China, Cochin China, etc., it is cultivated for the sake of its root. The root of the wild plant is slender, woody, and of a very strong flavor; that of the cultivated variety is much thicker and more fleshy, much milder in flavor and qualities, generally red, sometimes orange or yellowish white. The sub-varieties in cultivation are distinguished also by their form—some being longer and more tapering than others—by their size, and by the duration of their growth; the *early* kinds being also comparatively small, and almost exclusively cultivated in gardens for culinary use, while the larger and *late* kinds are often grown also in fields, for feeding cattle. The field cultivation of the C. is extensive in some parts of France, Germany, and Belgium, and is increasing in Britain. The C. appears to have been cultivated at an early period in Flanders and Germany, and to have been introduced into the gardens of England in the beginning of the 16th c. In the reign of Charles I., ladies wore C. leaves as an ornament instead of feathers; and the beauty of the leaves is still occasionally acknowledged by placing a root, or the upper portion of one, in water, that it may throw out young leaves to adorn apartments in winter. The C. prefers a light and rather sandy soil, and often thrives on a peat soil. It is very liable to the attacks of the larva of the crane fly (q.v.), by which the greater part of a crop is sometimes destroyed when the young roots are about the thickness of a quill; on which account, in gardens where there is particular reason to apprehend danger from this enemy, it is the practice to make a number of successive sowings, some of which may probably escape. As an article of food C. contains a large amount of what are called heat-producing compounds, with a small proportion of flesh-forming matter. It consists essentially of starch, sugar, and albumen, with a volatile oil which communicates a flavor unpleasant to many

CARROUSEL.

dyspeptics. The following is the composition of dried carrot:

Starch and sugar.....	93·71
Albumen.....	4·35
Red neutral substance (carotin).....	0·34
Fixed and volatile oils.....	1·00
Ash.....	0·60
	100·00

C. is easy of digestion, and gently laxative. Boiled C. is used as a poultice for foul ulcers and other sores, and as a vermifuge. Grated C. forms an agreeable, cooling, but also stimulant application. A sirup is prepared from carrots; and when cut into small pieces and roasted, they are occasionally used in Germany as a substitute for coffee. A strong ardent spirit is distilled from them in some parts of Europe, ten lbs. of carrots yielding about half a pint. C. seeds are employed as a diuretic, also as a carminative and stimulant; those of the wild C. being preferred.—Besides the crane fly, already noticed, carrots have numerous other insect enemies. One of the most troublesome is the CARROT FLY (*Psila rosæ*), a small dipterous fly, the larvæ of which, by eating away



Carrot Fly (*Psila rosæ*): *

a, larva, natural size; *b*, larva, magnified; *c*, *d*, its operations on the root; *e*, pupa, natural size; *f*, pupa, magnified; *g*, mature insect, natural size; *h*, mature insect, magnified.

the surface of the root, cause what is commonly known as *rust* in carrots, and prepare them for the further operations of millepedes and other destroyers. The larvæ of several species of moth (*Depressaria*) are very injurious to them when in flower and seed. An aphid (*A. dauci*) often kills the young plants.

CARROUSEL, *kar-rô-zel* [Fr.]: a species of knightly exercise, which, even till the beginning of the 18th c., was common in all the courts of Europe. C. was a kind or imitation of the tournament, and for a time after the discon-

* For the accompanying illustration, and many others of a similar nature throughout this work, we are indebted to Morton's *Encyclopædia of Agriculture*.

CARRY—CARSE.

tinuance of the latter seems to have supplied its place. The dresses, for the most part, were those of the knights of former times, and the combatants, or rather competitors, were divided into two parties, usually according to their different nationalities. One of the favorite exercises in France consisted in running at the pasteboard head of a Moor or Turk with a lance, cutting it down with a sword, or firing at it with a pistol. Another of these tests of skill and horsemanship consisted in carrying off a whole line of rings suspended for the purpose. The C. in France was not known earlier than the reign of Henry IV.; but it had existed for some little time previously in Italy. There where brilliant carrousels under Louis XIII., and two celebrated ones were given in honor of Mademoiselle de la Vallière—one at Paris, 1662, the other at Versailles, 1664. The place where the first of these fêtes was held has ever since been called the Place du Carrousel. A revival of the C. was attempted at Berlin 1750; and in 1828 the cavalry school at Saumur held one in honor of Madame la Duchesse de Berry. The so-called Eglinton Tournament—an entertainment given in England, 1839, by the chivalrous Earl of Eglinton—was in reality a carrousel.

CARRY, v. *kār'ri* [F. *charrier*; OF. *carier*, to convey in a car—from OF. *car*, a cart, a car—from L. *carrus*, a car: Gael. *caraich*, to move from one place to another]: to move a thing from one place to another; to remove; to bear; to convey; to effect or accomplish; to lead or draw; to produce; to transact or conduct; in *mil.*, to obtain possession of a military position by force. CAR'RYING, imp. CAR'RIED, pp. *-rīd*. CAR'RIER, n. *-rī-ēr*, one who. TO CARRY AWAY, in *naval language*, to break a spar; to part a rope. TO CARRY IT, to prevail; to gain the mastery. TO CARRY OFF, to kill; to bear away; to face out. TO CARRY ON, to promote; to help forward; to continue. TO CARRY OUT, fully to accomplish; to put into execution. TO CARRY THROUGH, to succeed by perseverance. CARRIER-PIGEON, a variety of the pigeon employed for carrying letters to the place where the birds have their home, which they do, from very great distances.—SYN. of 'carry': to bring; fetch; bear; convey; transport; support; sustain; exhibit; imply; contain; comprise; behave; conduct; demean; propel, see CARRIERS.

CARSE, n. *kárs* [W. *cors*, a bog]: in *Scot.*, low, fertile, alluvial land near a river, or the valley through which a river flows. The word in Stirlingshire is restricted in its sense to the level alluvial soils only a few feet above the river Forth. In Perthshire it applies to the whole of the slightly undulating lands to the north of the Tay, which form the C. of Gowrie. C. soils consist usually of argillaceous deposits, which produce crops of great luxuriance, although there are some which consist of barren clays. The richest are of a hazel color, and become friable when exposed to the action of frost; the poorest are of a yellow color, containing little vegetable matter to render them amenable to cultivation. The best kinds of C. soils are generally farmed on the six-course shift—1. Grass; 2. Oats;

CARSON—CARSTAIRS.

3. Beans; 4. Wheat; 5. Potatoes; 6. Turnips or Fallow. Large crops of grass are grown when the clover-plant catches. It is mostly made into hay, and the after-math is used for soiling horses and cattle in the straw-yards. The land is seldom pastured, as the feet of animals trample and destroy the grasses when the weather is wet. The oat-crop is more uncertain on the corses, but in favorable years the yield is large and the quality of the grain is excellent. Beans are very successfully grown; indeed the best of the C. soils are the best bean-soils in Scotland. Where the land is rich, and not too stiff, the potato is sometimes largely grown. On the poorest description of the C. soils the potato does not thrive. Wheat can be grown in closer succession on the C. lands than on any other description of land with the same expenditure of manure. A large stud of horses are required on C. lands, to enable the farmers to prepare the land for the various crops at the seasonable moment.

CARSON, *kâr'son*, CHRISTOPHER: 1809, Dec. 24—1868: May 23; b. in Madison co., Ky., from which his parents removed to the wilderness of Howard co., Mo., while he was an infant. He was a saddler's apprentice 1824-27, travelled extensively over the plains with a trapping expedition 1827-35, was hunter to Bent's Fort, 1835-43, and as scout accompanied Lieut. John C. Frémont on his Rocky mountain explorations. In 1847, Frémont sent him to Washington with dispatches, and while there he was appointed lieut. United States rifle corps; in 1853, he drove 6,500 head of cattle over the mountains into Cal. and on his return was appointed Indian agent in New Mex. He served through the Mexican and civil wars, rendering the govt. invaluable aid among the Indians and attaining the rank of brev. brig. gen., and at the close of the latter resumed his duties as Indian agent. In the early part of 1868 he took a deputation of Indians to Washington and then visited the principal n. and s. cities with them. 'Kit' C. was better known by a majority of Indian tribes than any other white man, spoke their dialects freely, and had their confidence. He died at Fort Lynn, Colorado.

CARSON CITY: capital of the state of Nevada, in a fertile and picturesque region near the foot of the Sierra Nevada, 178 n.e. of San Francisco. It is in Eagle Valley, Ormsby co., 4 m. from Carson river, 10 m. from lake Tahoe. The Nevada state prison is near the city. At C. C. is a United States branch mint for dealing with the immense quantities of gold and silver produced in this mining region. Pop. (1870) 3,042; (1880) 4,227; (1900) 2,100.

CARSTAIRS, *kâr'stärz*, WILLIAM: 1649, Feb. 11—1715, Aug.; b. Cathcart, near Glasgow: active in bringing about the revolution of 1688. He was educated at the village school of Ormiston, in East Lothian, and subsequently at the Univ. of Edinburgh, where he showed remarkable aptitude for learning. In his 24th year, Scotland being then in a most unsatisfactory state, alike politically and religiously, C. went to study theology at Utrecht. His scholarship,

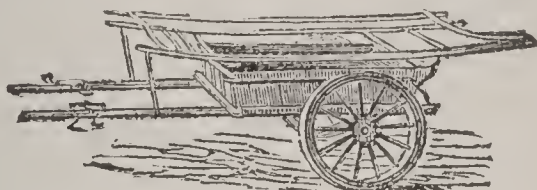
polite address, knowledge of men, and great political information, recommended him to the notice of the Prince of Orange, who chose him as his confidential adviser in all matters relating to Britain. In 1682, being in England on a mission of observation from Holland, he was employed to negotiate between the English and Scotch conspirators in the Rye House Plot. With others implicated, he was arrested and put to the torture of the thumb-screw, but refused to confess anything that had not been previously revealed, and that only on condition that what he said should not be used in evidence, either directly or indirectly, against any other person. At this time he had secrets from Holland of the greatest importance in his possession, which he carefully concealed, although there can be no doubt that their revelation would not only have saved him from torture, but have obtained for him great reward and honor. Britain, therefore, owes much to the firmness of C. at this juncture. He returned to Holland about the beginning of 1685; and, acting mainly on his advice, the Prince of Orange planned and carried out the invasion of 1688. He accompanied the prince as chaplain, and after the settlement of the crown, when the prince had been firmly established as William III., C. was instrumental in effecting a reconciliation between him and the Scottish Church, when the ill advice of other councilors had nearly led to an open rupture. From 1693 to the death of the king in 1702, he could not have had more influence in Scottish affairs if he had been prime-minister of the country; and his authority in church-matters was such that he was popularly called 'Cardinal Carstairs.' He was elected principal of the Univ. of Edinburgh 1704, and was presented to the church of Greyfriars. See *Life of C.*, by Rev. Dr. Story (1874).

CARSTENS, *kâr'stens*, ASMUS JACOB: 1754, May 10—1798, May 26; b. near Schleswig: German artist. In 1762, he went to Copenhagen, where, when first introduced to the royal gallery of paintings and casts from the antique he was so excited that he shed tears of joy. After staying seven years in the Danish capital, where he produced his *Baldur's Death*, and *Eolus and Ulysses*, supporting himself chiefly by portrait-painting, he commenced a journey on foot to Rome, but returned for want of means after reaching Mantua. He resided in Lubeck for some time, but through the kindness of a wealthy amateur artist named Rodde, he contrived to reach Berlin, where his great composition, the *Fall of the Angels* (with 200 figures), gained for him an appointment as prof. in the acad., while his decoration of a saloon in the Dorville Palace obtained an introduction to the king and a pension. He was now enabled to visit Rome, where he applied himself to the study of the works of Michael Angelo and Raphael. His first work in Rome, a *Visit of the Argonauts to the Centaur Chiron*, was distinguished by purity of style, beauty of forms, and fine distribution of light. His numerous subsequent drawings mostly represented scenes from the ancient classic poets, with subjects from Ossian, Dante, and Shakespeare.

CART.

CART, n. *kârt* [W. *cart*; Gael. *cairt*, a car, a cart: **AS.** *krat*; It. *carretto*; F. *charrette*—from L. *carrus*, a two-wheeled cart]: a carriage for the conveyance of goods, etc.: V. to carry away in a cart. **CART'ING**, imp. **CART'ED**, pp. **CAR'TER**, n. one who drives a cart. **CARTAGE**, n. *kâr'tāj*, conveyance in a cart; cost of goods so conveyed. **CART-HORSE**, a strong horse for drawing a cart. **CART-LOAD**, as much as can be carried in a cart. **CART-WRIGHT**, one who constructs carts.

CART: a species of carriage with two wheels. The C. is not very common in England, where the heavy and more capacious wagon takes its place (see **WAGON**); though it is used for agricultural and similar purposes. In Scotland carts are universally used. The Scotch C. weighs only about half a ton, while its usual load is from a ton to 22 cwt. In carrying hay, straw, or grain from the harvest-field, Scotch farmers employ a peculiar kind of C. without sides to admit of a bulky load; or they place on an ordinary C. a movable frame. The following advantages of one-horse



Scotch Cart, with movable frame.

carts are well enumerated by Lord R. Seymour: 'A horse, when he acts singly, will do half as much more work as when he acts in conjunction with another; that is to say, that two horses will, separately, do as much work as three conjunctively. This arises, in the first place, from the single horse being so near the load he draws; and in the next place, from the point or line of draught being so much below his breast, it being usual to make the wheels of single-horse carts low. A horse harnessed singly has nothing but his load to contend with; whereas, when he draws in conjunction with another he is generally embarrassed by some difference of rate, the horse behind or before him moving quicker or slower than himself; he is likewise frequently inconvenienced by the greater or less height of his neighbor; these considerations give a decided advantage to the single-horse cart. The very great ease with which a low C. is filled may be added; as a man may load it, with the help of a long-handled shovel or fork, by means of his hands only; whereas, in order to fill a higher C., not only the man's back, but his arms and whole person must be exerted.

The one-horse C. is employed by carriers all over Scotland: see **CARRIERS**. In France and Germany the carrier's C. is a more gigantic machine. Long in the body, very strong in construction, and poised on two high wheels with broad rims, this continental C. carries enormous loads, almost equal to those of the large wagons of England. The ingenious manner in which the load is adjusted to rest exclusively on the wheels, and so relieve the single horse in the shafts, is surprising to strangers.

CARTAGENA—CARTAGO RIVER.

CARTAGENA, *kâr-ta-jê'na*, Sp. *kâr-tâ-hâ'nâ* : fortified seaport of Spain, on a bay of the Mediterranean; lat. $37^{\circ} 36'$ n., long. $0^{\circ} 57'$ w. It is built partly on the declivity of a hill, partly on a plane extending down to the sea, and is inclosed by hills which screen it from all winds. The harbor is one of the best in the Mediterranean, capacious enough for the largest fleets. The entrance is narrow, and completely commanded by the fortifications on an island called La Isoletta, on the south. It was formerly the largest naval arsenal not only in Spain but in Europe. The city, which is surrounded by walls, has a Moorish aspect; its streets, cathedrals, and the ruins of an old castle being of that architecture. C. has manufactures of sail-cloth and glass, besides extensive blast furnaces and smelting works, and a trade in barilla, agricultural produce, and esparto grass. The tunny fishery is important, and its ancient silver and lead mines, recently reopened, are again productive—the export of lead to Great Britain and France in 1873 being 32,000 tons. The zinc and iron ores amounted to 496,000 tons. In 1873, C. was seized by a communal junta, but was retaken by the national forces in 1874. C., which was a colony of the Carthaginians, was built by Hasdrubal B.C. 242, under the name of New Carthage. It was the head-quarters of the Carthaginians in Spain, and soon became a city of much wealth and influence. It was captured by P. Scipio B.C. 210, and became of importance under the Romans, who are said to have employed 40,000 men daily in the mines in the neighborhood. It was sacked by the Goths, and did not again attain any note until the time of Philip II. Pop. (1900), with suburbs, 99,871.

CARTAGO, *kâr-tâ-gō*: city of the United States of Colombia, S. America, in the state of Cauca, 130 m. n.w. of Bogota; on the Viegá, a tributary of the Cauca river. It was founded by the Spaniards 1540, between the rivers Otau and Quindiu, and removed to its present site about 50 years later. It has good streets and houses, a cathedral, two churches, and several schools. The surrounding country is picturesque and well cultivated. Horned cattle and swine are raised, and fruits, coffee, cacao, sugar, and tobacco exported. Pop. (1880) 3,000; (1890) 6,000.

CARTAGO, or **CARTHAGO**: city, or rather the ruins of one, on the Cartago river (Costa Rica), about 60 m. from its mouth. Until 1841, it was the cap. of Costa Rica; but being in that year almost destroyed by an earthquake, it was supplanted by San José, previously its superior in wealth and importance, about 15 m. w.n.w. The volcano of the same name, doubtless connected with its overthrow, is a landmark to mariners.

CARTAGO, or **CARTHAGO**, *kâr-tâ'gō*, **BAY** : an almost landlocked lagoon of the Caribbean Sea near the n.w. extremity of the Mosquito shore.

CARTAGO, or **CARTHAGO**, **RIVER**: stream entering Cartago bay from the s.s.w., about lat. 15° n., and long. 84° west.

CARTAGO, or **CARTHAGO**, **RIVER**: stream in Costa Rica,

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flowing into the Gulf of Nicoya, an inlet of the Pacific, near lat. 9° 30' n., and long. 84° 30' west.

CARTE, n. *kârt* [F. *quarte*—from L. *quarta*, the fourth]: the fourth position of the wrist in fencing, by which a thrust may be made at an enemy's breast; a form of guard in fencing.

CARTE, n. *kârt* [F. *carte*, a card—from L. *charta*; mid. L. *carta*, paper]: a card; a bill of fare at a hotel.

CARTE, *kârt*, THOMAS: English historian: 1686–1754; b. Clifton, Warwickshire, Eng., where his father was parish minister. Educated at Oxford, he afterward took the degree of M.A. at Cambridge, and entering holy orders, was appointed reader at the Abbey Church, Bath; but being attached to the Stuarts, he resigned his office rather than take the oaths to the new government. In 1722, he was suspected of having been concerned in the conspiracy of Bishop Atterbury, whose secretary he was, and £1,000 was offered for his apprehension; but he escaped to France, where he remained for some years. On his return to England, he published a life of the Duke of Ormond, remarkable for the fulness of its information. In 1747–55 he published a *History of England*, bringing it down to the year 1654. This work is very valuable for its facts; but the author, though distinguished for research, had not the capacity to grapple with these philosophically. Hume and other historians have been much indebted to him for the materials of history. Among his other works was an edition of *Thuanus*; and at his death, he left 20 folio and 15 quarto vol. of MSS., in further illustration of the history of England to 1688, which have been very useful to subsequent writers. These are preserved in the Bodleian Library, Oxford.

CARTE-BLANCHE, n. *kârt-blăngsh* [F. *carte*, paper; *blanche*, white]: a paper signed but not filled up; unconditional power to do some business for another. CARTE-DE-VISITE, n. *kârt'dě-vî-zět'* [F.—literally, a card of visit]: a small photographic likeness gummed on a card—so called from its being the size of a visiting card: plu. CARTES-DE-VISITE, *kârtz'dě-vî-zět'*.

CARTEL, n. *kâr'těl* [F. *cartel*, a challenge—from It. *cartella*, pasteboard; *cartello*, a placard, a challenge]: formerly, a placard hung up containing a challenge; a letter of defiance or summons to fight; a written agreement between belligerents for an exchange of prisoners. CARTEL-SHIP, a ship employed in conveying exchanged prisoners, or in conveying the messenger to obtain such an exchange, but carrying no cargo, ammunition, or implements of war, except one gun for signals.

CARTER, ELIZABETH: 1717, Dec.—1806, Feb.; b. Deal, in Kent, England: linguist. Slow at first to learn, she afterward showed remarkable aptitude. In her 21st year she published a small volume of poems, and in the succeeding year she translated from the Italian of Algarotti *An Explanation of Newton's Philosophy for the Use of Ladies*.

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These publications obtained for her the friendship of such men as Bp. Butler, Abp. Secker, Sir Joshua Reynolds, Burke, and Dr. Johnson, the latter of whom especially had the highest opinion of her proficiency as a Greek scholar. A translation of Epictetus which she made, was most favorably received by the literary press of her time in various countries. She was never married.

CARTER, FRANKLIN, PH.D., LL.D.: 1837, Sep. 30 — — — — —; b. Waterbury, Conn.: scholar and teacher. He studied at Yale, and graduated at Williams in 1862; received the degree M.A. from Jefferson 1864, Ph.D. from Williams, and LL.D. from Union. In 1872, he became prof. of German in Yale, and 1881-1901 was pres. of Williams College. He has published a translation of Goethe's *Iphigēnie auf Tauris*, as a text-book (1878), and a *Life of Mark Hopkins* (1892).

CARTERET, kār'ter-et, JOHN, Earl GRANVILLE: orator and statesman: 1690, Apr.—1763, Jan.; son of Baron Carteret of Hawnes, Bedfordshire. His education, commenced at Westminster School, was completed at Oxford. From the latter place, according to Dean Swift's humorous assertion, he carried away more Greek, Latin, and philosophy than was at all becoming a person of such high rank. Introduced into the house of peers 1711, he spoke in favor of the Protestant succession, and in consequence received the early notice of George I., and obtained some lucrative appointments. In 1718-19, he was appointed ambassador extraordinary to Sweden, and in the following year succeeded in concluding a peace between Sweden, Prussia, and Hanover. In 1721, he was appointed sec. of state, and in this capacity defended with great zeal the proceedings of government in the Atterbury conspiracy. In 1724, he was made lord lieut. of Ireland. During his vice-regency he was in constant intercourse and held frequent discussion with Dean Swift about public affairs. His lord lieutenancy, 1724-26, and again 1729-30, was popular, particularly the latter period. From 1730-42, he was one of the most able and determined of the leaders of the opposition in the house of lords against Sir Robert Walpole, and on his displacement, was made a sec. of state. On the death of his mother 1744, he succeeded to the title of Earl Granville, and in the same year had to resign his seals of office, the Broad-bottom administration (q.v.) expressly excluding him; but he continued to receive marks of the royal favor. C. was a most liberal patron of men of letters.

CARTESIAN, a. kār-tē'zhĭ-ăn: pertaining to the doctrines of the French philosopher Descartes (q.v.): **N.** a person who believes in the philosophy of Descartes.

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CARTHAGE, *kâr'thĭj*, called *Carthāgo* by the Romans, *Carchēdon* by the Greeks, both of which are but forms of the native name *Karth-hadtha*, i. e., 'New Town' (found on ancient coins): greatest city of antiquity on the n. coast of Africa, situated in what now constitutes the state of Tunis, on a peninsula extending into a small bay of the Mediterranean Sea. It was founded, according to legend, by Dido (q.v.), a Phœnician queen, who had fled from Tyre after the murder of her husband almost nine centuries before the Christian era, but more probably (like the Anglo-Indian Calcutta) it originated in an emporium or *factory* established by the colonial merchants of Utica, and the capitalists of the mother-city Tyre, on account of the convenience of its situation. Little is known of its growth. Modern information of C. begins only after C. had become one of the greatest commercial cities of the world, and the accounts of it even then are scanty. The pop. before its destruction was about 700,000, partly of Phœnician, partly of Libyan descent. The territory which the Carthaginians acquired by the subjugation of the Libyan tribes, and by the ultimate annexation of older Phœnician colonies, with which they had at first been simply in alliance, such as Utica, Hadrumetum, Tunis, Hippo, the two Leptēs, etc., extended in the middle of B.C. 5th c. s. to Lake Triton, e. to the Great Syrtis, and w. to Hipporegius (now Bona). The maritime power of the Carthaginians enabled them also to extend their settlements and conquests to the other coasts of the Mediterranean. In B.C. 6th c., they were masters of Sardinia, and had begun to contend for the possession of Sicily. Hanno (q.v.) founded colonies on the w. coast of Africa beyond the Straits of Gibraltar, and Himilco visited the coasts of Spain and Gaul. The relations of C. to foreign states in earlier times are not very clear. The first treaty with the Romans was concluded B.C. 509; the second, B.C. 348; the third, B.C. 306. The connected history of C. begins with B.C. 5th c., a period of wars between the Carthaginians and the Greeks in Sicily. The Carthaginian army under Hamilcar was destroyed by Gelon at Himera B.C. 480. It was not till B.C. 410 that the war began which ended in the conquest by the Carthaginians of some parts of the island. Dionysius the elder, or rather the pestilence working for him, put a stop to their conquests, but did not succeed in expelling them. War raged almost constantly between Dionysius and the Carthaginians. The more feeble reign of Dionysius the younger afforded them an opportunity of extending their conquests, yet they were frequently repelled and defeated by the Sicilian Greeks; and during B.C. 311-301, Agathocles carried the war into Africa, and attacked C. itself. After his death the Carthaginians again increased their dominions in Sicily; and although Pyrrhus contended successfully against them at first he left that island entirely B.C. 275. The subjugation of the s. of Italy by the Romans, brought the two great and conquering nations into collision, and the first Punic war arose B.C. 264, and after a great naval victory of the Romans, ended in 241, the Carthaginians giving up Sicily, Sardinia, and Corsica, and paying to the Romans a large sum of money. Soon after this, a mu-

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tiny of the hired troops of C., combined with an insurrection of the Libyan tribes, the ancient inhabitants of the country, who were kept down by the arbitrary rule of the Carthaginian colonists, threatened the entire ruin of the city. Hamilcar brought that bloody war, however, to a successful termination, and led an army to Spain, where he, and after him Hasdrubal, obtained great success. Here was founded New C., now Cartagena (q.v.). After Hasdrubal's death, B.C. 221, Hannibal (q.v.), burning to revenge the defeat which his native city had sustained from the Romans, broke the treaty with them, and took Saguntum, B.C. 219. Thus began the second Punic war, in which Hannibal pursued his career of conquest from Spain, through Gaul, and across the Alps into Italy itself, defeated the Romans with terrible slaughter in various battles, and, by that of Cannæ in particular, brought Rome to the very brink of ruin. Yet the war terminated in the total defeat of the Carthaginians by Publius Cornelius Scipio, who overthrew their power in Spain, and was victorious over Hannibal in the final and decisive battle of Zama, in Africa, B.C. 202, Oct. A peace was then concluded, in which the Carthaginians were limited to their African territories; but most of their ships of war and war-elephants were taken from them, besides an immense sum of money, and they were put under bond not to make war without permission of the Romans. Massinissa, King of Numidia, skilfully availed himself of dissensions which arose within C. between the nobles and the people, to advance his own interests at the expense of the Carthaginians; and as they (B.C. 151) opposed him, and drove his adherents out of the city, the Romans seized the opportunity for a new declaration of war, B.C. 149, on the ground that the treaty was broken; and after a siege of two years, C. was taken by Publius Cornelius Scipio Aemilianus, B.C. 146. For six days the combat was maintained in the streets of the city, and for seventeen days the work of its destruction by fire was carried on by the conquerors. The country became a Roman province. C. Gracchus sent out 6,000 colonists to found a new city on the site of Carthage. It was called Junonia, but it did not prosper. Augustus, carrying out the intention of his great uncle, restored the city, and the new C. had become, in the 2d and 3d c. of the Christian era, one of the finest cities of the Roman empire. In A.D. 439, Genseric made it the cap. of the Vandal kingdom; Belisarius conquered it 533, and named it Justiniana; the Arabs under Hassan utterly destroyed it 647; and now only two or three small hamlets and a few ruins mark its site.

There remain no satisfactory accounts of the constitution of the Carthaginian state. It is certain that it was oligarchical, and that the chief power was in the hands of the great families (*gentes*), from whose members the senate, amounting to 300, was chosen. This senate appointed, as it were, a more select council of 30, and sometimes a still smaller one of only 10, at the head of whom were two *suffetes* (probably the same as the Hebrew *shofetem*, 'judges'), but it is not certain what relation these bore to one another, or how their power was apportioned between them. We can gather

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dimly, from various scattered statements, that the Carthaginian oligarchy, while despising the multitude, was itself split up into factions, and torn by family jealousies. Corruption prevailed; and it would perhaps have been better for the country if the power had been in the hands of a popular despot than of a band of insolent and tyrannical nobles.

The Carthaginian army was raised from the conscription of the subjugated Libyans, from the hired Numidians, and from slaves. In the time of Agathocles, the city sent forth 40,000 heavy armed infantry, 1,000 cavalry, and 2,000 war-chariots, but the state could easily raise 100,000 troops. The fleet in the first Punic war consisted of 350 ships, carrying 150,000 men. How C. contrived to raise revenues sufficient to cover the enormous expense her military and naval organization involved, is not clear. It was probably, derived from tribute imposed on subject Libyan or Numidian races, in great part from mines in Spain, and from import duties derived from her maritime and inland trade, which was prodigiously great. Her merchantmen visited every coast and island of the Mediterranean, and even ventured as far as the Azores, Britain, the Baltic, etc.; while her caravans penetrated through Sahara to the gold-producing districts of the Niger, and through the Libyan desert to the lands along the Nile.

The religion of the Carthaginians appears to have been substantially the same as that of the Phœnicians—a worship of the stars and of fire. Moloch was the chief deity, and to him children and captives were sacrificed. The highest natural manifestation of this deity was the sun. Besides Moloch, the Carthaginians worshipped the Tyrian Hercules; Astarte, the goddess of the elements; Esmun, the god of the celestial vault; and a variety of heroes, heroines, and genii or spirits, such as the Genius of Death, Hamilcar (who fell at the battle of Himera), Dido, the brothers Philæni, etc., as well as a few of the lesser Greek divinities, of whom a knowledge had been obtained in Sicily. It does not appear that there was a distinct sacerdotal order in Carthage. It is conjectured that religious ceremonies were performed by the dignitaries of the state.

CAR'THAGE, BATTLE OF: minor battle of the war of secession, 1861, July 5. Gen. Sigel with 1,500 Union troops encountered about 3,500 Confederates under Gen. Price and Gov. Jackson, who were retreating from Gen. Lyon's army, 7 m. e. of Carthage, Jasper co., Mo. Sigel opened with his artillery, in which alone he was superior. After enduring this for several hours, the Confederates attacked him with their cavalry. To protect his baggage train and avoid being flanked, Sigel fell back in good order to Carthage and to Sarcoxie, 15 m. e., with less than 50 killed and wounded. The Confederate loss was said to be four times as heavy.

CARTHAGE, CAPE: headland of n. Africa, jutting out into the Mediterranean, lat. $36^{\circ} 52'$ n., long. $10^{\circ} 23'$ e. Traces of the ancient city of Carthage (q.v.) are found on it n. of the Tunis lagoon.

CARTHAGENA—CARTHUSIAN.

CARTHAGENA, *kâr-ta-jě'na*, Sp. *kâr-tâ-hã'nã*: capital of the state of Bolivar, one of the United States of Colombia. It stands on the Caribbean Sea, a little s.w. of the mouth of the Magdalena, lat. 10° 26' n., long. 77° 54' w., having the best harbor on the coast, with a naval arsenal and strong fortifications, completed 1717 at enormous cost. The city was sacked 1585 by the English under Sir Francis Drake. Its population is estimated at 10,000, not more than one-tenth being white. The temperature ranges from 80° to 86° F.—the air, however, being dry and healthy. In the history of Spanish America, and more especially in that of the war of independence, the city occupies a prominent place.

CARTHAGENA BARK: see **CINCHONA**.

CARTHAGINIAN, a. *kâr'thã-jĩn'ĩ-ăn*: pertaining to ancient Carthage; N. a native of.

CARTHAGO, NOVA: see **CARTAGENA**.

CARTHAMUS, n. *kâr'thã-mũs* [new L.—from Gr. *ka-thai'ro*, I purge, I purify]: the wild or bastard saffron; safflower (q.v.); the *Carthamus tinctorius*, ord. *Compositæ*, sub-ord. *Cynároceph'älæ*. **CARTHAMINE**, n. *-mĩn*, or **CARTHAMEINE**, the pink dye or coloring matter obtained by a chemical process from the safflower in crystals insoluble in water, but slightly soluble in alcohol and ether. When newly precipitated, C. immediately and permanently attaches itself to cotton or silk, but not to wool, requiring no mordant, dyeing the fabric a fine red, which is changed to yellow on the addition of alkalies, and may be returned to red again on being treated with acids.

CARTHUSIAN, n. *kãr-thũ'zhĩ-ăn*: one of an order of monks, named from Chartreux in France: **ADJ.** pertaining to. The Carthusians originated with St. Bruno, who retired in 1086 with six companions to the solitude of La Chartreuse near Grenoble, where they built hermitages, wore rude garments, and lived upon vegetables and coarse bread. In 1134, the fifth prior, Guigo, composed a body of rules, called the *Statuta Guigonis* or *Consuetudines Cartusiæ*, but they have been often changed. After 1170, when the order received papal approbation, it extended rapidly. It dates from 1180 in England, where the name of Chartreuse-houses was corrupted into charter-houses. The C. were divided into two classes, fathers (*patres*) and brothers (*conversi*). Each occupied a separate cell, with a bed of straw, a pillow, a woolen coverlet, and the means of manual labor or of writing. They left their cell, even for meals, only on festivals and on days of the funeral of a brother of the order. Thrice a week, they fasted on bread, water, and salt, and there were several lengthened fasts in the year. Flesh was forbidden at all times, and wine, unless mixed with water. Unbroken silence, except on rare occasions, was enforced, as well as frequent prayer and night-watching. These austerities were continued, with little modification, by the modern C. The order at one time counted 16 provinces, and can still boast some of the most magnificent convents in the world—as *La Grande Chartreuse*, near Grenoble, and *Certosa*, near Pavia.

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They were given to hospitality and works of charity, and were on the whole better educated than the mendicant orders. Their principal seats were in Italy, France, and Switzerland; but they have shared the fate of the other monastic establishments, and their convents are now for the most part solitudes.

The Carthusian nuns arose at Salette, on the Rhone, in France, about 1229. They followed the rules of the Carthusian monks, but with some mitigations, of which the most notable is that they have a common refectory.

CARTIER, *kâr-tyā'*, Sir GEORGE ÉTIENNE: 1814, Sep. 6—1873, May 20: Canadian statesman, descendant of Jacques C.: b. St. Antoine. He was educated at St. Sulpice, Montreal, and began to practice law in that city 1835. In the rebellion of 1837, C. took up arms, and a price of \$2,000 was put on his head, but he escaped and was afterward amnestied. He was elected to the house of assembly from co. Verchères 1848, and became provincial sec. 1856, soon afterward attorney-gen., and premier 1858. From this time C. was steadily in the cabinet, except for one year. He bore a part in abolishing feudal tenure in Lower Canada, in codifying its laws, in making the legislative council elective, and in the confederation of the various provinces. He was made a baronet 1868. While minister of militia his health failed, and he died during a visit to England.

CARTIER, JACQUES: 1494, Dec. 31—abt. 1555; navigator and explorer; b. St. Malo, Brittany, France. He sailed from his native town 1534, April 20, in command of two ships and 120 men, reached Newfoundland May 10, passed n. and then w., and claimed Labrador and Canada for the French king by erecting crosses. He reached home with two Indian boys Sep. 5, but the next year went out with three vessels, sailed up the St. Lawrence to Hochelaga, which he called Mont Royal (thence Montreal) 1535, Oct. 2. Wintering at the mouth of the Ste. Croix, the party suffered from scurvy, a disease then unknown to Europeans, and returned in disgust 1536 with ten chiefs whom C. had kidnapped. The idea of colonizing Canada was abandoned till Roberval obtained permission to form a settlement. At his expense and the king's, C. was sent out 1541, May 23, with five ships, as 'captain-general and chief-pilot;' he arrived at the Ste. Croix Aug. 23, and built a fort, Charlesbourg, near the site of Quebec. The Indians gave trouble, and C. went back 1542, meeting Roberval at Newfoundland, and disregarding his command to stop. His supposed fourth voyage, 1543, to bring Roberval back, is uncertain. He gave no sign of appreciating the importance of his discoveries. Francis I. rewarded him with the lordship of Limoilon; the date of his death is not exactly known. Journals of his first and second voyages appeared in Ramusio's *Collection*, Venice, 1565, and an account of his third in Hakluyt's *Voyages*, 1600. These were collected by the Historical Soc. of Quebec 1843.

CARTILAGE, n. *kâr'tī-lāj* [F. *cartilage*—from L. *cartil-ag'īnem*, gristle]: gristle; a tough elastic substance, incapable of extension, which usually precedes the formation of bone.

CARTILAGINOUS FISHES.

CAR'TILAG'INOUS, a. -tŭ-lăj'ŭ-nŭs, having gristle instead of bones. Cartilage is of a pearly whiteness, and to the unaided eye seems uniform and homogenous. Cartilages may be divided into *temporary*, *permanent*, and *accidental*. The *temporary* cartilages are substitutes for bone in the earlier periods of life, and after a certain time become ossified: see **OSTEOLOGY**. At birth the extremities and larger eminences of the long bones, and the margins of the flat bones are still cartilaginous, and this C. does not altogether disappear till the period of puberty. The *permanent* cartilages are either *articular* or *non-articular*. *Articular* cartilages are attached to the extremities of bones, and enter into the formations of joints. *Non-articular* cartilages are usually more flexible than the articular. They are sometimes attached to bones, to lengthen them out, as, for instance, in the nose, the auditory canal, and the Eustachian tube: see **HEARING, ORGANS OF**. In other cases they form the basis of distinct organs, as the larynx, the trachea, and the eyelids. *Accidental* cartilages are cartilaginous concretions, occasionally found in situations where they are not normal: they are of no general interest. For the microscopical characters of C., see **CELLS**: for its chemical composition, see **GELATINOUS TISSUES: GLUTEN**.

CARTILAGINOUS FISHES, *kâr-tŭ-lăj'ŭ-nŭs*: fishes which have a skeleton destitute of bony fibres. In some of these fishes, the skeleton is merely rudimentary, so that they seem to form an intermediate link between vertebrate and invertebrate animals. In the lancelets (q. v.) (*Amphioxus*), it consists of nothing more than a slender, transparent, flexible dorsal column; in *Myxine*, also, it is a soft, flexible tube, without appearance of vertebræ or of ribs; in the lampreys, the dorsal column is still a mere cylinder of cartilage, without any notable division into segments; while even in the sturgeon, the centre of the backbone is a continuous gelatinous cord, and in the sharks the vertebræ are formed of hollow cones, meeting at their apices in the middle, and having their cups filled with the remains of the gelatinous cord, an arrangement from which result great elasticity and flexibility. In many instances, even in the higher C. F., several vertebræ are united in a single piece; in all of them the skull is formed of a single piece without sutures, though the general form agrees with that of the skull of other fishes, and the same parts or regions may be recognized. The calcareous matter present in the skeleton is always deposited in a granular manner, giving a characteristic dotted appearance; but even in the skull of the basking shark, one of the most highly organized, the earthy matter has been found to form little more than three per cent. of the whole substance; in the skeleton of the lamprey, it is only one and a half per cent. In other parts of their organization C. F. differ from each other very widely, some of them possessing the organs of the senses in as great perfection as any fishes whatever while in others these organs are very imperfectly developed. Linnæus placed the C. F. with batrachian reptiles in his class *Amphibia*. By the general consent of naturalists, however, they are placed in the class of fishes. Cuvier, referring to the

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very different degrees of organization which they exhibit, says 'they form a series ranging parallel to the bony fishes, just as the marsupial mammalia range parallel with the other ordinary mammalia.' Owen and others, admitting the justice of this view, have, however, pointed out in the C. F. generally characters corresponding with those of the osseous fishes in their embryotic state, and with the permanent or mature conditions which prevailed among the fishes of some of the older geological periods. One remarkable characteristic even of the higher groups of C. F.—sturgeons, sharks, rays, etc.—is the *heterocercal* tail, the vertebral column being prolonged into the upper portion of the caudal fin, and the lower one given off on its under side, as in the fossil fishes generally of the Old Red Sandstone and other oldest fish-producing rocks.—Cuvier divided C. F., or *Chondropterygii* [Gr. cartilage-finned], into three orders: *Sturiones* (Sturgeon, Chimæra, etc.), having the gills free, and gill-openings with a lid, like the osseous fishes; *Selachii* (Sharks and Rays), having the gills fixed, and consisting of folds of membrane on a plane surface, with numerous gill-openings, the jaws movable as in other fishes generally; and *Cyclostomi* (Lampreys, etc.), also having fixed gills and numerous gill-openings, the mouth adapted for sucking. Müller and Owen, however, separate the *Cyclostomi* of Cuvier from the other C. F. on account of important anatomical differences, particularly in the structure of the heart, which in the *Cyclostomi* lacks the *bulbus arteriosus*, or thick muscular swelling of the commencement of the arterial system close to the ventricle; while this which may be considered as a third chamber of the heart is present in the *Sturiones* and *Selachii*, and within it are three or more longitudinal rows of valves; characters derived from the vascular system being deemed by these great naturalists of the highest value in determining the arrangement of the class of fishes. The lancelets occupy a place by themselves, from their absolutely lacking a heart. For the reproduction of this group of fishes, see REPRODUCTION: see also FISHES: SHARKS: etc.

CARTOGRAPHY, n. *kâr-tôg'ra-fĩ*, or **CHARTOGRAPHY**, n. *châr-tôg'ra-fĩ* [Gr. *charte*; L. *charta*, a leaf of paper: F. *carte*, card, chart; Gr. *grapho*, I write]: the art of forming maps or charts.

CARTOON, n. *kâr-tôn'* [It. *cartone*, pasteboard—from *carta*, paper. L. *charta*]: in the *fine arts*, C. is a design on strong paper, of the full size of a work to be afterward executed in fresco, oil color, mosaics, or tapestry, or on glass. The object of the artist in preparing a C. is, that he may adjust the drawing and composition of his subject in circumstances in which alterations can be effected with facility, before proceeding to the execution of the work itself. Cartoons are generally composed of a number of sheets of stout paper or pasteboard, pasted together at the edges, and stretched on a frame. The surface is sometimes *primed*, or washed with a ground-color; but more frequently this process is dispensed with. The drawing is made either in chalks or in *distemper* (q.v.), in which latter case the C. itself has much

the appearance of a fresco. Frequently only two colors are used, merely for the purpose of producing light and shade, in which case the C. is said to be *in chiaro oscuro*. The C., when finished, is transferred to the canvas or plaster on which the work is to be executed, either by tracing with a hard point, or by pricking with pins, charcoal in both cases being used. Sometimes lines are simply drawn across it, or, if it is wished to preserve it from injury, threads are stretched across it from pins placed at the required distances along the edges. In *fresco* painting (q.v.), the plaster on which the work is executed must be wet, in order that it may absorb the color, and consequently only a small portion can be executed at a time, and the C. must be traced in small compartments of the size that the artist can finish without stopping. It is here, consequently, above all, that the necessity for the previous execution of a C. is greatest, as it would be impossible to sketch the whole design on the plaster in the first instance. But the great masters used such studies in *chiaro oscuro* as guides to them in almost all their extensive works, and many of these monuments of their care, as well as of their genius, have been preserved. We have cartoons of Andrea Mantegna, Domenichino, the Caracci, etc.; but the finest specimens of cartoons in existence are those of Raphael at Hampton Court. These marvellous conceptions were sent to Flanders in the reign of Leo X., in order that they might be copied in tapestry in two sets, one designed for the pope, the other for a present by the pope to Henry VIII. of England. The tapestries, which are very inferior to the designs, are still in existence. One set is in Rome, the other was in England to the death of Charles I., when it was purchased by the Spanish ambassador, and carried to Spain. At a recent period it was sent to London and offered for sale, but as no English purchaser was found, it was again carried to the continent. For many years the cartoons, originally 25 in number, lay neglected at Brussels, and many of them were destroyed. The seven now at Hampton Court were at length purchased by Rubens for King Charles I. It is an instance of Cromwell's good sense, in a direction not often associated with his name, that at the despersion of the royal collections, these cartoons were purchased for the nation by his special command. So low was the artistical taste of the time, however, that while the *Triumph of Julius Caesar* by Andrea Mantegna, still at Hampton Court, was valued at £2,000, the cartoons of Raphael were set down at £300! In Charles II.'s time, these remarkable works were again consigned to oblivion. An attempt was made to have them copied in tapestry, by which they were seriously injured. William III., strangely enough, followed in Cromwell's footsteps in appreciating what Charles II. had neglected. He had the cartoons restored, and built a gallery for them at Hampton Court, where, with the exception of a visit to Windsor in George III.'s time, they have since sojourned. The following are the subjects of these exquisite conceptions: 1. Paul Preaching at Athens; 2. The Death of Ananias; 3. Elymas, the Sorcerer, struck with Blindness; 4. Christ Delivering the Keys to Peter; 5. The Sacrifice at Lystra; 6.

CARTOUCH—CARTRIDGE.

The Apostles Healing the Sick at the 'Beautiful Gate' of the Temple; 7. The Miraculous Draught of Fishes. Several of the lost cartoons are partially transmitted to us by engravings, some of which were executed from the tapestries; others, it is believed, from the originals. The subjects of these are—1. The Adoration of the Kings; 2. Christ appearing to Mary Magdalene; 3. The Disciples of Emmaus; 4. The Murder of the Innocents; 5. The Ascension. These were engraved with the others, by Somereau, a French engraver, in 4to. Other cartoons of Raphael exist—one the property of the Duke of Buccleuch, and two in the possession of the king of Italy, which are said to have belonged to the set sent to Flanders. There is also a portion of one in the National Gallery in London, but it is now painted over with oil color. The best engravings of the cartoons at Hampton Court are by Dorigny, Audran, and Holloway; but in future it is probable that they will be more known to the public by photographs.

CARTOUCH, or **CARTOUCHE**, n. *kâr-tôsh'* [F. *cartouche*—from It. *cartoccio*, a paper case]: paper case or roll containing a charge for fire-arms; a soldier's cartridge-box; formerly a small wooden case filled with 200–300 musket-bullets, and eight or ten one lb. balls to be fired from a mortar or howitzer (now superseded); a pass or ticket of leave given to a soldier; in *arch.*, a tablet, either for ornament or to receive an inscription, so formed as to resemble a sheet of paper or parchment, with the edges and ends rolled up; often seen on tombs; also, a modillion, or bracket supporting a cornice; an oval on which the hieroglyphics for the names of Egyptian kings are sculptured; see **CAVO-RILIEVO**.

CARTOUCHE, *kâr-tôsh'*, **LOUIS DOMINIQUE**: abt. 1693–1721, Nov. 28; b. Paris: robber. Expelled from school, and afterward from his father's house, for theft, he joined a band of outlaws in Normandy. Returning to the capital he became the head of a company of banditti, over whom he exercised power of life and death, and terrorized Paris for some years, though a high price was put on his head. At length he was arrested by chance in a cabaret. His trial lasted several months and caused much excitement. On the rack he betrayed none of his accomplices, but it is said he gave their names at the place of execution, in revenge for their not attempting a rescue. Expecting a sortie by his comrades, a vast crowd gathered to see him broken on the wheel. His life has been written several times.

CARTRIDGE, n. *kâr'trij* [a corruption of *cartouch*: L. *charta*, paper]: a small bag or case made of paper, pasteboard, wool, etc., for containing powder and balls, used for loading rifles or cannon—containing powder alone they are called **BLANK-CARTRIDGES**—with ball they are called **BALL-CARTIDGES**. **CARTRIDGE-BOX**, the small leather case in which the soldier holds his cartridges. **CARTRIDGE-PAPER**, light-colored strong paper, originally manufactured for soldiers' cartridges (q.v.); extensively used in art, its rough surface being useful for certain kinds of drawing.

CARTRIDGE.

CARTRIDGE : cylindrical case, to contain either the whole or a part of the materials for discharging from a fire-arm. Those for ordnance or large guns are made chiefly of serge and flannel, sewn up into the form of a bag, which, supplied with a given weight of powder, is tied round the neck, and strengthened by iron hoops. The weight of powder varies from about 300 lbs. for an 81-ton gun, to a few ounces for a mountain gun.

Cartridges for small-arms that load at the muzzle are usually paper tubes, containing a leaden ball and a few drams of powder. The tubes are made in such a way that the powder has two or three thicknesses of paper around it, while at the mouth of the tube and over the bullet there is only one. The paper over the bullet is lubricated generally with a composition of beeswax and tallow. In loading, the paper at the mouth of the tube has to be twisted or bitten off; the powder is then poured into the barrel, the tube reversed, and the bullet inserted into the muzzle, and the tube broken away. Cartridges for breech-loading small-arms are generally formed of a thin sheet of brass coiled into a cylinder, and having an iron case, in the centre of which is the percussion arrangement. For those used in the Snider and the Martini-Henry rifles, see **BREECH-LOADING**. Besides the C. case of coiled brass, there are others made of solid brass or copper, an American invention, gaining favor abroad—the Prussians having adopted such a case for the new Mauser rifle.

For muzzle-loading shot guns, the chief cartridges used contain a charge of shot packed in a paper cylinder of a size suitable for the bore of the gun. Some of these, in addition to the paper covering, are surrounded with a wire network, for the purpose of increasing the range and penetration.

The C. for breech-loading shot guns is usually a stout cylinder of paper with a metal case. They are made of various sizes to suit different calibres of guns, and with pin or

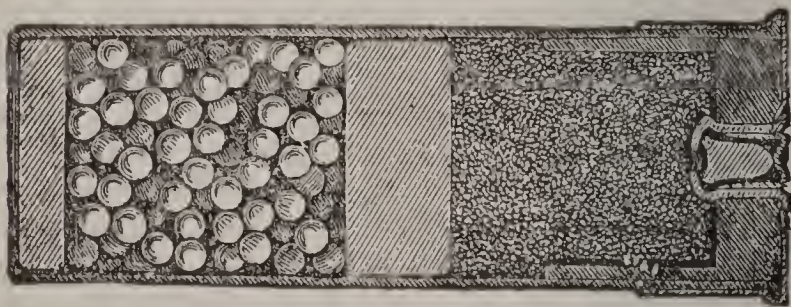


Fig. 1.

central fire ignition. In the pin-fire C. a small brass pin passes through the side of the case into the percussion cap, and protrudes through a small hole in the top of the barrels. The pin is struck by the hammer of the gun, and forced into the percussion cap, which explodes, and ignites the

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powder. In the central-fire C. the cap is in the centre of the case, and is exploded by the hammer of the gun acting on a piston contained in the false breech. Fig. 1 is a longitudinal section of a central-fire C., full size.

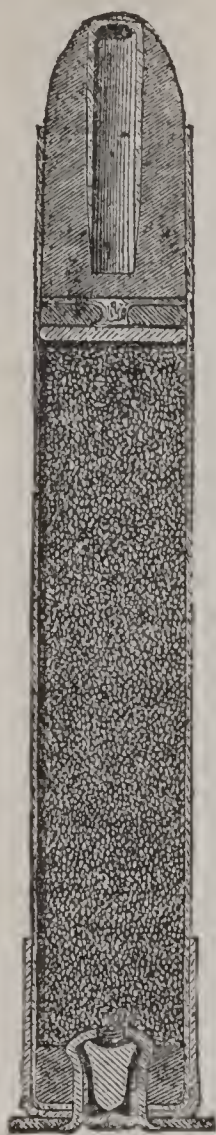


Fig. 2.

In America, a solid brass C. case is often used for shot guns.

For sporting rifles the cartridges are as numerous and as varied as for shot guns. With large-bore rifles the same C. case is generally used as for shot guns, but loaded with powder and ball (spherical, solid conical, hollow conical, or shell). For small-bore, or what are known as express rifles, either a coiled brass C. case, similar in construction to that for the Snider or Martini-Henry rifle, but made to contain a larger charge, or a solid brass case is used. The coiled case can be reloaded twice or thrice, while the solid case can be reloaded as often as twenty times, and on this account the latter is rapidly gaining favor with sportsmen in India and Africa. The express C. contains a very heavy charge of powder, with a light hollow conical bullet giving very great velocity, low trajectory, and immense killing power. Fig. 2 is a longitudinal section of a .450 gauge Henry express C. (full size), the charge of powder in which is four drams, while the bullet weighs only 270 grains.

Cartridges for breech-loading pistols and revolvers are generally small metal cylinders containing a charge of powder and a bullet, and with rim, pin, or central fire ignition, the diameter varying from .230 of an inch upward.

CARTULARY, *n.* *kār'tū-lér-ĭ* [*F. cartulaire*—from mid. *L. cartulāriūm*, for *chartulārĭūm*, a register of title-deeds and acts of a religious house—from *L. charta*, paper]: a register book: in *OE.*, one who kept the registers, etc.; also spelled **CHARTULARY** (q.v.).

CARTWRIGHT, *kārt'rīt*, **EDMUND**: 1743, Apr. 24—1823, Oct.; b. Marnham, Nottinghamshire, England: inventor of the power-loom. Educated at Oxford, he obtained a living in the English Church, and devoted himself exclusively to his ministerial duties and to literature, until a casual conversation, 1784, directed his attention to machinery, and in 1785 he exhibited his first power-loom (q.v.) in action, an ingenious though very rude machine; upon which, however, he effected improvements rendering it almost perfect. Its introduction was vehemently opposed, and a mill fitted up with 500 of his looms was ignorantly and maliciously burned down. C., in 1790, took out a patent for combing wool, and secured patents for various other improvements in connection with manufactures. But his

CARTWRIGHT.

patents yielded him little return, and in 1809, government, in consideration of his inventions, granted him £10,000. C. was the author of a legendary poem, entitled *Arminia and Elvira*, and other poetical pieces.

CARTWRIGHT, JOHN: 1740, Sep. 28—1824, Sep. 23; b. Marnham, Nottinghamshire, England: parliamentary reformer. He entered the navy at the age of 18, served under Hawks and Palliser, and was chief magistrate of the Newfoundland station for five years, during which he explored the interior of the island. His liberal views were expressed in *American Independence the Glory and Interest of Great Britain* (1774). Sympathizing with the colonists, he refused to fight against them, renounced a prospect of naval promotion, and asked to be placed on the retired-list. Lord Howe tried in vain to shake his resolution. The first publication on parliamentary reform, except Earl Stanhope's pamphlets, 1774, was C.'s *Take your Choice*, called in a second edition *The Legislative Rights of the Commonalty Vindicated*. His effort was now devoted to the cause of universal suffrage and annual parliaments. He was an unsuccessful candidate for parliament 1778. He founded the Soc. for Constitutional Information 1780, and later the Corresponding Soc.; was a witness at the trial of his friends Horne Tooke, Thelwall, and Hardy, 1794; published many pamphlets, and labored untiringly. He removed to London 1810. Having advised Birmingham, which had no representation, to send to the house of commons a 'legislatorial attorney,' he was indicted 1819 for conspiracy and sedition, convicted 1820, and fined £100. He was greatly respected and beloved by the liberals. Fox in parliament praised his 'profound constitutional knowledge, purity of principle and consistency of conduct through life.' C. was one of the first to denounce the slave trade as piracy. His *Life and Correspondence*, edited by his niece, appeared in 2 vols. 1826. A bronze statue of him was erected in Burton Crescent, London, 1831.

CARTWRIGHT, PETER, D.D.: 1785, Sep. 1—1872, Sep. 25; b. Amherst co., Va., but taken to Ky. in childhood. He entered the Methodist ministry 1807, and won much fame as an itinerant on the border. His rude eloquence, dauntless courage, and primitive zeal made 'the backwoods preacher' a power in the west, and one of the great names of his connection, in which he was a presiding elder from 1812. He served 20 years in Ky. and Tenn., and 45 in the Ill. Conference; baptized over 12,000 persons, received 10,000 into membership, and preached some 15,000 sermons. His autobiography, edited by W. P. Strickland, appeared 1856. C. died at Pleasant Plains, Sangamon co., Illinois.

CARTWRIGHT, THOMAS: abt. 1535—1603, Dec.; b. Hertfordshire, England: Puritan divine. He studied at Cambridge, where, in 1570, he was chosen Margaret divinity professor. His lectures here were too honestly critical of the polity of the church to be acceptable to the chief authorities, who deprived him of his professorship, and subsequently of his fellowship. C. travelled on the continent and made the friendship of such men as Beza, who, in a letter concerning

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him, says, 'I think the sun doth not see a more learned man.' On his return to England, he again became embroiled with the church and the government, and for his nonconformity suffered imprisonment several times. He entered into the memorable and protracted controversy with Abp. Whitgift, which took a wide range as between prelacy and a presbyterian puritanism, and has been continued in the English Church by the successors of these two champions to this day. C.'s claim was that the church should be reformed in government as well as in doctrine, to accord with the Scriptures. He prepared the *Directory of Church Government*, issued by authority of the long parliament, more than 40 years after his death. By his learning, his intellectual power, and his unfaltering zeal, C. was the hero of English Presbyterianism. He wrote many controversial articles; among them, *A Confutation of the Rhemish Translation, Glosses, and Annotations on the New Testament*.

CARUCATE, n. *kār'ū-kūt* [mid. L. *car'uca*, a plow]: in *OE.*, the quantity of land which can be plowed in a year.

CARUNCLE, n. *kār-ŭng'kl* [L. *carun'cula*, a little piece of flesh—from *carnem*, flesh]: a small fleshy excrescence, diseased or natural, as the comb of a cock; in *bot.*, a fleshy or thickened appendage at the hilum of some seeds. CARUN'ULAR, a. *-kū-ler*, pertaining to, or having the form of a caruncle. CARUN'ULATE, a. *-lāt*, having a fleshy excrescence.

CARUS, *kā'rōs*, KARL GUSTAV: German scholar, physiologist, physician, and artist: 1789, Jan. 3—1869, July; b. Leipzig. He attracted notice first by a series of lectures on comparative anatomy, in his native city about 1812. After having superintended, during the war of 1813, the French hospital at Pfaffendorf, he went to Dresden, where he was appointed prof. of midwifery in the newly organized medico-chirurgical acad.; but resigned his office when elected court-physician and councilor of state. His house was the rendezvous of all the most distinguished savans and artists in Dresden. C. wrote a vast variety of works, some of which are marked by original and striking views, as, for instance, *Ueber den Kreislauf des Blutes der Insecten*, in which he demonstrates the circulation of the blood in insects.

CARVALHOE MELLO: see POMBAL.

CARVE, v. *kārṽ* [AS. *ceorfan*; Dut. *kerven*, to cut or carve: Ger. *kerben*, to notch]: to cut into pieces, as meat; to cut into forms or shapes; to sculpture. CAR'VING, imp. N. the act of cutting; the art of cutting figures in wood, etc.; sculpture. CARVED, pp. *kārvd*. CAR'VER, n. one who. CARVING-KNIFE, a knife for cutting and slicing meat at table. To CARVE OUT, to cut or take out from some large thing; to lay out by design.

CARVEL, n. *kār'vēl* [another form of CARAVEL (q.v.)]: a small ship; a jelly-fish. CARVEL-BUILT, having the joints of the outer planks in a ship's sides, all smooth, edge to edge: see CLINCHER-BUILT.

CARVER—CARVING.

CARVER, *kâr'vër*, JOHN; d. 1621, Apr. 5: first gov. of Plymouth. He left a good estate in England, became an officer of the Rev. John Robinson's church at Leyden, and was sent thence to effect a treaty with the Virginia Co. He obtained a patent 1619, and sailed in the *Mayflower* with the 101 colonists 1620. Arriving at Plymouth Dec. 21, C. was unanimously elected gov., and showed ability and prudence in administering the affairs of the infant colony, and in dealing with the Indians, but died four months after landing. He was 'a man of great piety, integrity, and firmness of mind.'

CARVIN-EPINOY, *kâr-vǎng' ā-pē-nuố'*: town of France, dept. of Pas-de-Calais, 11 m. s.s.e of Lille by railway. There are manufactures of beet-root sugar, starch, earthenware, and leather. Pop. (1881) 7,759; (1886) 6,528.

CARVING: subordinate branch of sculpture, performed usually on ivory or wood. Ivory was the favorite material for this purpose in the the east from an early period. Among the Babylonians, who likewise practiced gem-engraving to a great extent, carved heads for staves were executed in vast quantities, as every Babylonian carried a staff and a signet-ring. During the palmy days of Grecian art, ivory was largely employed; the nude portion of the colossal statues of the gods being composed of some solid material overlaid with plates of ivory, while the remaining portions were of plate gold. At a later period, ivory was chiefly used for small works, usually decorative. During the earliest period, statues of the gods were generally of wood, painted, gilt, or draped with colored robes, different kinds of wood being appropriated to different divinities. Carvings in ivory form an important branch of early Christian sculpture. Among the most curious of these are the ivory tablets adorned on the outside with low-reliefs, and in the inside coated with wax for the purpose of writing upon. The chair inlaid with ivory that belonged to Abp. Maximilian in the cathedral at Ravenna, is of this period (546-555). In 803, Charlemagne received two richly-carved doors as a present from Constantinople, but works of the same kind were executed much earlier. Toward the end of the middle ages, the art of carving in wood was brought to a high degree of perfection in Germany. Altars were adorned with carvings of this material, often of large size, and with numerous figures; in general the nude portions were carefully and tastefully colored after nature, and the draperies gilt. Specimens are in the churches at Altenburg, Erfurt, Prague, and in some churches in Pomerania. The finest and most perfect specimens are a series of reliefs relating to the doctrine of transubstantiation in the church at Tribsees. Many of the Belgian churches also possess very beautiful examples of wood-carving. Michael Wohlgemuth of Nuremberg, and after him Veit Stoss, were eminent carvers in wood. The wood-carving on the great altar of the cathedral at Schleswig by Hans Bruggemann belongs to the beginning of the 16th c. Many graceful specimens of wood-carving, on a smaller scale, belonging to this period, are in museums. Nurem-

berg was celebrated for its wood-carvings; but only a few of the many works ascribed to Albert Dürer can be assigned to him with certainty. Portrait medallions, usually cut in box, were in vogue during the early part of the 16th c. The first artist in this line was Hans Schwartz of Augsburg. During the 17th and 18th c. ivory was again extensively employed in crucifixes, crosses and goblets, with relief representations. The most eminent artist is Franz de Quesnoy.

CARY, *kā'rĭ*, ALICE: 1820, Apr. 26—1871, Feb. 12: poet: b. Mt. Healthy, O., 8 m. from Cincinnati. Her grandfather, a soldier of the revolution, removed to O. from Conn. She began writing at 18, and drew attention by sketches signed 'Patty Lee' in the *National Era*. With her sister Phœbe she published *Poems* (1850), but most of its contents were her own. It was followed by *Lyra and other Poems* (1853), a large vol. of *Poems* (1855); *Lyrics and Hymns* (1866); and a *Lover's Diary* (1867). Her muse was pure, graceful, and tender, but some preferred her prose to her verse, especially in the three series of *Clovernook* (1851, '53, '54), and *Clovernook Children* (1854). In a similar vein were *Pictures of Country Life* (1857), and *Snowberries* (1869). She wrote also several novels: *Hagar* (1852); *Married, not Mated* (1856); *Hollywood* (1856); *The Bishop's Son* (1857). Her last 20 years were spent in New York, in untiring literary labor and much ill health, lightened by the society of her sister and the affection of many friends.

CA'RY, HENRY FRANCIS: 1772—1844; b. Birmingham: clergyman of the Church of England, known for his admirable translation of Dante. At Oxford, where he entered Christ Church as a commoner 1790, he was distinguished as a classical scholar, also for knowledge of Italian, French, and English literature. In 1805 he translated Dante's *Inferno*, and in 1814 the whole of the *Divina Commedia*, a translation remarkable not only for its accuracy but for its expressiveness and force. He afterward translated Pindar's *Odes* and Aristophanes's *Birds*, and wrote a series of memoirs, in continuation of Dr. Johnson's *Lives of the Poets*. C. was vicar of Bromley Abbot's, Staffordshire; and for some years he was asst. librarian in the British Museum. He was buried in 'Poets' Corner,' Westminster Abbey. A memoir by his son was published 1847.

CA'RY, PHŒBE: 1824, Sep. 4—1871, July 31; sister of Alice C.; b. near Cincinnati. Her *Poems and Parodies* appeared 1854, her *Poems of Faith, Hope, and Love* 1867. Her talent was supposed to be nowise inferior to her sister's, and marked by 'more variety, spirit, and humor.' She is remembered chiefly by the lyric, *One Sweetly Solemn Thought*, written, not, as generally stated, 'at the age of seventeen,' but 'one Sabbath morning in 1852, on her return from church.' Exhausted by the strain of her sister's long illness and grief at her loss, she died a few months afterward at Newport, R. I. A monument to Alice and Phœbe was erected by their friends, headed by Horace Greeley, over their remains in Greenwood cemetery. A sketch of the two was written by M. C. Ames, 1873.

CARY—CARYOCAR.

CA'RY, Sir **ROBERT**, Earl of Monmouth: b. 1559 or '60; son of Henry Cary, Lord Hunsdon: rose to eminence in the civil service of Queen Elizabeth. For a number of years he acted as English warden on the marches. As a courtier, he was present at the death of Elizabeth, 1603, and expeditiously rode on horseback to Edinburgh to communicate the intelligence to her successor, James VI. At the coronation of Charles I., he was elevated to the peerage as Earl of Monmouth. At his death without male issue the earldom became extinct. Sir Robert Cary wrote his *Memoirs* (Edin. 1808), a work interesting chiefly from notices connected with border history.

CA'RYA: see **HICKORY**.



Caryatis:

From ruins in the Villa Strozzi, on the Appian Road—height, 7 feet 10 inches.

CARYATIDES, n. plu. *kār'î-ăt'î-dēs* [plu. of *Caryatis*, a woman of *Caryæ*, in *Acadia*]: in *arch.*, female figures used as columns to support entablatures. **CARYATIC**, a *kār'î-ăt'îk*, pertaining to. The traditional account of the origin of the name is, that the inhabitants of *Caryæ*, having joined the Persians after the battle of Thermopylæ, the Greeks, after their victory over the Persians, destroyed the town, slew the men, and carried the women into captivity. As male figures representing Persians were used for this purpose, it occurred to Praxiteles, and other Athenian artists, that female *Caryatæ*, in their national costume, might be thus employed to commemorate the disgrace of their country. Lessing, and various other writers, have treated this account as fabulous; but it seems confirmed by a bas-relief preserved at Naples, in which two female figures are represented in the attitude of *C.*, and which has a Greek inscription mentioning the conquest of *Caryæ*. Male figures used for the same purpose are called *Atlantes* (q.v.).

CARYL, *kār'îl*, **JOSEPH**: 1602–73; b. London: Congregational divine. He was a commoner at Exeter College, Oxford, became preacher at Lincoln's Inn, and took part in the affairs of the commonwealth. Parliament directed him to attend Charles I. at Holmby house, and sent him and Owen to Scotland with Cromwell 1650. Ejected 1662, he gathered an independent congregation near London bridge, and served it till death. His *Commentary on Job* appeared 1644–66 in 12 vols. quarto, and 1669 in two huge folios; it was much praised, and much laughed at for the disproportion of its size to the subject. The absurdly large mass contained, however, many valuable thoughts.

CARYOCAR, *kār'î-ō-kâr*: genus of large trees of the nat. ord. *Rhizobolaceæ*, and almost constituting the whole order. They are natives of Guiana and Brazil, and are

CARYOPHYLLACEÆ—CARYOTA.

sometimes called *Pekea* trees. They yield good timber for ship-building, and produce the delicious nuts called *Butter nuts* or *Souari nuts*. The fruit is a sort of drupe, containing several combined nuts. The fleshy part of the drupe consists of a butter-like substance, which melts between the fingers, and is used in cookery instead of butter, on which account these trees are sometimes called *butter-trees*. It forms merely a thin covering for the nuts, the bristles on the outer surface of which, in some of the species, sting like the hairs of the nettle, and are very troublesome to those who open them. The kernels are remarkably soft. An oil is extracted from them scarcely inferior to olive oil. *C. nuciferum* is now cultivated in the island of Saint Vincent; but *C. butyrosu*m, *C. glabrum*, *C. tomentosum*, and other species appear equally worthy of attention.

CARYOPHYLLACEÆ, *kār'-ī-ō-fīl-lā'sē-ē*: natural order of exogenous plants, containing upward of 1,000 known species, mostly herbaceous plants, a few half shrubby. The stems are tumid at the articulations; the leaves always opposite and entire, often uniting around the stem. The flowers are regular; the calyx persistent, of 4-5 sepals, either free or united into a tube; the corolla of 4-5 petals, which are frequently bifid, and generally terminate in a claw at the base, sometimes lacking; the stamens as many, or twice as many, as the petals; the ovary of 2-5 carpels; the stigmas sessile; the fruit is a one-celled capsule, with central placentæ, to which the seeds are attached.—The plants of this order are natives mostly of temperate and cold countries; some are found only on tropical mountains, near the limit of perpetual snow. Most of them are inconspicuous weeds: some produce beautiful flowers; almost all are insipid and inert; a few contain *saponine*, and afford a substitute for soap: see SOAPWORT. To this order belong the pink, carnation, sweet William, lychnis, chickweed, etc.

CARYOPHYLLIA, n. *kār'-ī-ō-fīl'li-ā* [Gr. *karūōphullon*, a clove—from *karūōn*, a nut; *phullon*, a leaf—*lit.*, clove-shaped]: in *geol.*, a section of lamellated flower-like corals. CAR'YOPHYLLA'CEOUS, a. *-lā'shūs*. in *bot.*, pink-like, applied to corollas of five petals with long claws. CAR'YOPH'YLLIN, n. *-ōf'īl-līn*, a crystalline substance extracted from cloves.

CARYOPHYLLUS: see CLOVES: MYRTACEÆ.

CARYOPSIS, n. *kār'-ī-ōp'sīs* [Gr. *karūōn*, a nut, a kernel; *opsis*, sight, form]: in *bot.*, a dry, one seeded, indehiscent fruit, in which the seed and pericarp are so incorporated as to be inseparable, forming a single grain—as in wheat, barley, rye, maize, etc.

CARYOTA, *kār'-ī-ō'ta*: genus of palms, natives of the East Indies, one of which, *C. urens*, remarkable for the acidity of its fruit, which produces a burning sensation when its pulp is applied to the skin, is highly valuable for the great quantity of juice (*toddy*) which flows from its wounded spathes, sometimes, in the hot season, to the

CARYSFORT REEF—CASALE.

amount of 100 pints in twenty-four hours from a single tree. Sugar (*jaggery*) is made from this juice by boiling it down, whence this palm is sometimes called the jaggery palm. The pith of old trees, or farinaceous part of the trunk, is also much used for food, and is said to be equal to the best sago. The outer part of the stem is very hard, and applicable to many purposes. The fibres of the leaf-stalks are made into ropes, which are very strong and durable; the leaf-stalks, merely stripped of the leaflets, are used as fishing-rods, being light, tapering, and elastic; and the woolly substance found at their base is sometimes used for calking ships. This palm is found in India and Ceylon, and abounds chiefly in mountainous districts. It rises to a height of 60 ft., with a trunk of a foot in diameter, and a magnificent spreading head of great double pinnate leaves, and triangular leaflets, the apex of the triangle being their point of attachment.

CARYSFORT REEF, *kār'iz-fōrt rēf*: dangerous coral reef near the s. extremity of Fla.; lat. 25° 13' n., long. 80° 13' w.; on the edge of the Gulf Stream. It has an iron lighthouse with a revolving light 166 ft. above the sea.

CASA: prefix frequent in Italian and Spanish names; meaning *house, home*.

CASABIANCA, *kā-zā-be-ān'kā*, LOUIS: about 1755—1798, Aug. 1; b. Bastia, Corsica. He entered the navy when a boy, embraced the principles of the Revolution, was elected to the national convention, voted for the imprisonment of Louis XVI. and not for his death, and was a member of the Council of Five Hundred. As captain of *L'Orient*, Admiral Brueys's flag-ship, he went to Egypt in the fleet conveying Bonaparte and the army. In the action of Aboukir Bay his powder magazine exploded, his ship was burned, and he perished with his son, a boy of ten. The name has been made famous by a ballad of Mrs. Hemans, which pathetically improves upon the tragic facts. The family is still prominent in Corsica.

CASACALENDA, *kā-sā-kā-lēn'dā*: town of Italy, province of Compobasso, 17 m. n.e. of Campobasso, on the site of the ancient Calela. Fruits and wine of good quality are produced in the district, where silk-worms are also reared. Pop. 6,900.

CASALE, *kā-sā-lā*: city of n. Italy, province of Alessandria, on the right bank of the Po, which is here crossed by an iron bridge, 38 m. e.n.e. of Turin. It is a place of considerable antiquity, and occupies the site of a more ancient town. Many Roman remains are found, and coins of the early ages of the republic. It has a cathedral, dating from the 8th c., with valuable archives. The old citadel, founded 1590, was one of the strongest in Italy, and within recent years the fortifications have been greatly strengthened and extended. During the Italian campaign of 1859, C. was occupied by divisions of the Sardinian army, and for a short time was the headquarters of the French emperor. It has manufactures of silk-twist, and

CASAL-MAGGIORE—CASANOVA DE SEINGALT.

a trade in the produce of the district, which is very fertile. Pop. (1881) 17,096; (1891) 27,514.

C. formerly gave its name to a province of about 350 sq. miles, with a pop. abt. 143,000.

CASAL-MAGGIORE, *ká-sál'mád-jō'rā*: town of n. Italy, province of Cremona, on the left bank of the Po, 22 m. e.s.e. of Cremona. Being subject to frequent inundations from the river, strong embankments have been constructed for its protection. It has manufactures of earthenware, leather, glass, etc. Pop. 4,000.

CASAL-PUSTERLENGO, *ká-sál'pós-tér-lén'gō*: town of n. Italy, province of Milan, 12 m. s.e. of Lodi, on the road to Cremona. It has manufactures of silk fabrics, linen, and earthenware, and extensive trade in Parmesan cheese, which is here manufactured of the best quality. Pop. 5,600.

CASAMASSIMA, *ká-sá-más'ē-má*: town of Italy, province of Bari, 14 m. s.e. of the city of Bari. It has a convent and two abbeys, and the vicinity produces wine and almonds. Pop. 7,600.

CASANOVA, *ká-zá-no'vā*, FRANCIS: 1732–1805; b. London, of Venetian parents: painter of battles and landscapes. Educated in Italy, he afterward went to Paris, from which he was driven by the severe criticism of Diderot. C. then took up his abode in Dresden, where he painted chiefly battle-pieces, and by one of his greatest works gained a place in the Academy. He afterward went to Vienna, and painted for the Empress Catharine her victory over the Turks. He died at Briel, near Vienna. The execution, especially the coloring of his works, is excellent.

CASANOVA DE SEINGALT, *dēh sìn'gált*, or *dēh sǎn-gált'*, GIOVANNI JACOPO: 1725–1803; b. Venice: adventurer of the Cagliostro species. He studied in Padua, afterward in Venice, intending to be a priest. Having been expelled for sufficient reasons from a seminary of priests, he travelled to Naples, visited Rome, and after many adventures, arrived in Constantinople. On his return to Venice, 1745, he supported himself for a time by his skill as a violinist, until he gained some celebrity by curing a senator who had been attacked by apoplexy. His irregularities again drove him from Venice, and he wandered about for some time among the chief cities in the n. of Italy, Milan, Mantua, Verona, Ferrara, Bologna, Parma, etc., but in 1750 he went to Paris, where he was patronized by the nobility, and became acquainted with several eminent authors. His peregrinations were endless and inexplicable. He visited almost every European capital, was somehow introduced to the best company, invariably excited the disgust or ill-will of those who knew him, and had always to 'vanish' after a brief period of enjoyment. In 1761, he appears as distinctly professing the miraculous after the Cagliostro fashion; having undertaken to regenerate old Madame D'Urfé, into a young man—for a pecuniary consideration. He died in Bohemia. His celebrated memoirs, *Mémoires écrits par Lui-même* (12 vols.,

CASAREEP—CASAUBON.

Leip. 1826-38), contain many interesting notices of the manners of his times, intermixed with details of his personal adventures.

CASAREEP, or CASSIRIPE, *kās'sa-rēp*: sauce or condiment made from the juice of the bitter cassava or manioc root. It is of the highest esteem in Guiana, where it is used to flavor almost every dish; and it is the basis of the favorite West Indian dish called *pepper-pot*. It is a powerful antiseptic, and meat can by means of it be kept for a long time quite fresh, even in a tropical climate. It is made by evaporating and concentrating the juice, which is also mixed with various aromatics. The poisonous principle of the juice is dissipated in the evaporation, so that although the juice in a fresh state is readily fatal to life, the C. is perfectly safe and wholesome. C. is imported into Holland and Britain, and remains unimpaired in quality for several years.

CASAS GRANDES, *kā'sās grán'dēs* [Sp., great houses]: town of Mexico, province of Chihuahua, on the C. G. or San Miguel river, abt. 35 m. s. of Llanos and 150 m. n.w. of the city of Chihuahua. It derives its name and note from ruined buildings, supposed to be of an aboriginal race. These were constructed of sun-dried blocks of mud and gravel, abt. 22 in. thick and usually 3 ft. long. The walls are in places 5 ft. thick, and appear to have been plastered. The chief building is 800 ft. long by 200 wide, and seems to have been three separate edifices united by galleries. The rooms were of all sizes; the walls are still 50 ft. high in parts, and indicate that there were probably six or seven stories. 450 ft. away are the remains of a smaller building with rooms ranged round a square court. The district contains many artificial mounds, in which are found stone axes, grinders or *metates*, and earthen vessels, ornamented with colors, and superior to the modern pottery of that region. Similar ruins are near the Gila and the Colorado: Squier supposed them to have been built by the Moquis.—Pop. of C. G., 4,000.

CASAUBON, *ka-saw'bon*, or *kā-zō-bōng'*, ISAAC DE: 1559, Feb. 8—1614, July 1; b. Geneva: scholar and critic. In 1582, he was appointed prof. of the Greek language at Geneva. Subsequently he held professorships at Montpelier, 1596, and at Paris, 1598; but the death of Henry IV. rendered his position (C. being a Protestant) very insecure, and he therefore gladly accepted the offer of Sir Henry Wotton to visit England. King James received him with distinction, and appointed him, some time after, prebendary of Canterbury and Westminster. He died in London. His acute investigation and criticism were applied to several branches of archæology and theology. Among his chief works are the able dissertation, *De Satirica Græcorum Poësi et Romanorum Satira* (1605), the treatise *De Libertate Ecclesiastica* (1607), and the *Exercitationes contra Baronium* (1614), a confutation of Cardinal Baronius. His critical and exegetical works include editions of Diogenes Laertius, Aris-

CASAUA—CASCARILLA.

otle, Theophrastus, Suetonius, Persius, Polybius, Theocritus, Strabo, etc.—See *Isaac Casaubon*, by Mark Pattison (1875).

His son, MERIC C., 1599, Aug. 14—1671, July 14, was born at Geneva, and educated first at Sedan. He accompanied his father to England, and entered Christ Church College, Oxford, where he took his degree of M.A. 1621. He was appointed rector of Ickham, near Canterbury, 1628, and afterward professor of theology at Oxford, where he died. His attachment to Charles I. deprived him of all his preferments during the commonwealth, but at the restoration he received them again. Meric was, like his father, distinguished for erudition; edited the works of Marcus Aurelius Antoninus, Terence, Epictetus, etc.; and wrote a treatise, *De Enthusiasmo* (Lond. 1655).

CASAUA, or CASSAVA, n. *kǎ-sǎ'vǎ* [Sp. *cazabe*]: bread made from the starch obtained from the root of the cassava (q.v.) or manioc plant; the two varieties are named sweet cassava and bitter cassava—from the root of the latter tapioca is prepared; the *Janīpha manīhot*, ord. *Euphorbiacēæ*.

CASBIN, *kās-bēn'*, or KAZVIN, *kāz'vīn*: town of Persia, province of Irak-Ajemi, 90 m. w.n.w. of Teheran. It is on an extensive plain of the same name, and is inclosed by walls. Before the time of Shah Abbas the Great C. was for a brief period the cap. of Persia. The plain affords good pasturage, and in the vicinity of the town are extensive vineyards and orchards. The town is very extensive, but a great part of it is in ruins, owing to frequent earthquakes. Some velvets, brocades, and coarse cotton cloth are manufactured; and C. has also considerable trade in raw silk, rice, etc. Pop., formerly estimated at 200,000, now probably less than 40,000.

CASCABEL, or CASCABLE, n. *kās'kǎ-bl* [Sp. *cascabel*, a little bell]: in *mīl.*, the portion of a smooth-bore gun lying between the base ring and the rear or butt end.

CASCADE, n. *kās-kād'* [F. *cascade*—from It. *cascata*, a fall of water—from It. *cascare*, to fall]: a waterfall; water flowing over steep rocks.

CASCADE RANGE of mountains: see WASHINGTON (Territory).

CASCALHO, n. *kās-kǎl'yō* [Port. *cascalho*, gravel]: a name given in Brazil to the gravelly deposit in which diamonds are found.

CASCARILLA, n. *kās'kǎ-rīl'lä* ['little bark;'] Sp. *casoara*, bark of trees]: name in S. America for many different kinds of bitter medicinal barks, including Peruvian bark itself; and the name C. is used for a subdivision of the genus *Cinchona* (q.v.). In Europe, the name C. Bark (*cortex cascarillæ*) is given to the bark of the *Croton Eleutheria* (see CROTON), a small tree, native of the West Indies, especially Jamaica, where it is known as the *Sweet-wood* and the *Sea-side Balsam*—being used in making incense (q.v.) and

CASCO BAY—CASE.

pastils. It is imported in considerable quantities into Europe from the Bahama Islands, and appears in commerce in small thin fragments and in quills. It is sometimes used as a substitute for cinchona, although inferior in tonic and febrifuge qualities. It is a favorite medicine in Germany.—The barks of a number of other species of *Croton* appear to possess properties similar.

CASCO BAY, *kās'kō*: indentation abt. 20 m. wide, into which Portland harbor opens, on the s.w. coast of Me. Cape Elizabeth is its w. headland. Many hundreds of islands and islets make the bay very picturesque. It is a favorite summer resort.

CASE, n. *kās* [F. *caisse*, a box: It. *cassa*, a chest: Sp. *casco*, a cask: Dut. *kast*; Ger. *kiste*, a chest: L. *capsa*, a box; *cassus*, hollow]: a hollow thing; a covering; a box; a sheath; a frame; a certain quantity: V. to cover in; to put in a case or box. CA'SING, imp.: N. a covering. CASED, pp. *kāst*. CASE-HARDEN, v. *-hār'dn*, to harden the outer part—as iron, by converting it into steel. CASE-HAR'DENING, imp. CASE-HAR'DENED, pp.: ADJ. *familiarly*, lost to all sense of honor or shame. CASE-KNIFE, a long kitchen-knife. CASE'WORM, n. caddice-worm; a worm or grub which makes itself a case. CASE-SHOT, bullets in a case, which bursts and scatters the bullets on leaving the gun; same as canister. CASE'MAN, n. a compositor.

CASE, n. *kās* [F. *cas*, a case, a matter—from L. *casus*, a fall]: that which falls, comes, or happens; an event; condition or state in which any person or thing may chance to be; a question for discussion; a cause in a court; the inflection of nouns. IN CASE, if it should so happen. IN GOOD CASE, in good condition or health of body.

CASE, in Grammar: see DECLENSION.

CASE, in Legal Phraseology: often used as synonymous with cause, but having separate though not always very definite meanings. A formal written argument, prepared with a view to obtaining the opinion of a court of law, is called a case.

CASE, in Letter-press Printing: receptacle for types, generally $32\frac{1}{2}$ inches long, $16\frac{1}{2}$ inches broad, and $1\frac{1}{2}$ inch deep, and divided into compartments or 'boxes,' each of which contains types of one class or letter. A pair of cases consists of an upper and a lower case: the upper one has 98 'boxes,' and contains the capitals, small capitals, and some other letters only occasionally required in composition; the lower one has 54 'boxes,' and holds the letters of the small character, figures, spaces, and most of the points. The places assigned to the several letters of the alphabet in the boxes of the case are not precisely the same in all printing-offices, but the differences are few. The accompanying illustration shows a prevalent arrangement. When in use, the cases lie on a frame four ft. high, and the compositor stands in front of them. The different sizes of the boxes in the lower case depend upon the comparative frequency in

CASE—CASE-HARDENING.

which the several letters occur in composition, and the position in the case allotted to each letter is such as to afford the greatest facility in composing. The letter *e*, which is most run upon in the English language, has a box much larger than any of the other compartments, and is placed directly

Upper case.

*	†	‡	§	||	¶	⌘	¼	½	¾	⅛	⅜	⅝	⅞
						£	—	—	3m br'e		—	—	—
&	Æ	Œ	æ	œ		\$	—	—	3m d'sh	Æ	Œ		&
A	B	C	D	E	F	G	A	B	C	D	E	F	G
H	I	K	L	M	N	O	H	I	K	L	M	N	O
P	Q	R	S	T	V	W	P	Q	R	S	T	V	W
X	Y	Z	J	U	[	(	x	y	z	j	u	h'ir sp.	ff

ff	fl	5m sp.	4m sp.	,	k		1	2	3	4	5	6	7	8
j						e							ff	9
!	b	c		d			i		s		f	g	fi	0
?														
z	l	m		n		h	o		y	p	w	,	n qd.	m qd.
x											;	:		
q	v	u		t		3m spaces	a		r		.	-	quads	

Lower case.

in front of the compositor. In the upper case the boxes are of uniform size, and the letters are place in alphabetical order, the comparatively rare occurrence of capitals rendering it immaterial which letter is nearest the compositor's hand. A case will hold a quantity of 'letter,' sufficient to 'set up,' about five pages of this work, equal to about 16,000 types.

CASE, WILLIAM: 1780, Aug. 27—1855, Oct. 19; b. Swansea, Mass.: missionary. He was admitted to the N. Y. Meth. Epis. Conference 1805, and was presiding elder in central and w. N. Y., and in Canada, 18 years. From 1828 he was supt. of M. E. Indian schools and missions in Canada, gaining a dominant influence over Canadian Methodism, and the name of 'Apostle to the Canada Indians.' He died at Alnwick mission house.

CASE-HARDENING: process of converting the surface of certain kinds of malleable-iron goods into steel, thereby making them harder, less liable to rust, and capable of taking on a better polish. Fire-irons, portions of fine grate-fronts, gun-locks, and other articles of limited size, are very

CASEINE.

commonly so treated, but the process is sometimes applied to large objects, such as rails for railways. The articles are first formed of bar iron, and being heated to redness, are sprinkled with a little powdered yellow prussiate of potash, and heated again. The result is, that the heat decomposes the prussiate of potash, and the liberated carbon combines with the iron, forming a coating of steel on the surface. Another mode of C. is to heat the articles along with some animal matter, such as the parings of horns and a little common salt, from one-half hour to several hours; the articles are then cooled in cold water, or in oil if of a delicate nature. Charcoal alone also is used. The coating of steel is very thin, seldom exceeding $\frac{1}{16}$ th of an inch. Where it is wanted to be thicker, the articles are treated several times. A Swedish iron-master has found that a very excellent case-hardening is obtained by treating iron objects with a mixture of animal matter and arsenious acid dissolved in hydrochloric acid, and heating as usual.

CASEINE, n. *kā'sē-în* [L. *casēūs*, cheese]: the cheesy portion of the curd of milk; the proteid constituent of milk. CA'SEOUS, a. -*ūs*, like cheese; having the qualities of cheese. CA'SEIC, a. -*īk*, of or from cheese.

CA'SÈINE, or CASEUM: organic compound allied to albumen (q.v.), found in the milk of the mammalia; also in peas, beans, and other leguminous seeds, when it receives the name of LEGUMINE. The proportion of C. in milk (q.v.) varies, but averages about three per cent., and it may be coagulated and separated therefrom by the addition of a little rennet (q.v.), as in the manufacture of cheese (q.v.), or by the employment of a few drops of a mineral acid, such as dilute sulphuric acid. In either case, the C. separates as *curd*, which still retains attached to it some oil and earthy salts, though the greater portion of these substances, with the sugar, remain in the watery liquid or *whey*. The elementary bodies which enter into the composition of C., and the proportion in which these are present in 100 parts are—carbon, 53·83; hydrogen, 7·15; nitrogen, 15·65; oxygen, 22·52; and sulphur, 0·85. The properties of C. are that it is not coagulated by heat, as is well evidenced in the heating of milk, but is coagulated on the addition of rennet; sulphuric, hydrochloric, or nitric acids; alcohol, creasote, or infusion of galls, but not by acetic acid. It also forms insoluble precipitates with solutions of the poisonous salts, acetate of lead, nitrate of silver, and bichloride of mercury (corrosive sublimate), and hence the efficacy of taking large doses of milk in cases of poisoning by those deadly salts, as the C. in the milk, forming an insoluble compound with the poison, keeps it from exerting its deadly powers.

The form of C. obtained from plants, and termed legumine, is generally procured from leguminous seeds, like peas or beans, though it can be extracted also from the majority of vegetable substances, especially from sweet and bitter almonds, and even from tea and coffee. Dried peas contain a fourth of their weight of legumine, and this can be extracted by bruising the peas to powder, and digesting in warm water

CASEMATE—CASERTA.

for two or three hours. The liquid is then strained through cloth, which retains the insoluble matters, and allows the water with the legumine dissolved therein, and with starch mechanically suspended, to pass through. On settling, the starch falls to the bottom of the vessel, and the clear liquid holding the legumine in solution, on the addition of a small amount of acetic acid, yields a precipitate of legumine or vegetable caseine. So perfectly does the vegetable C. resemble the C. from milk, that the one can hardly be distinguished from the other by chemical tests or by taste; and at the present time there is regularly prepared in various parts of China, especially near Canton, a form of cheese from peas, which is sold to the populace in the streets of Canton under the name of *Taofoo*. C. is a most important article of food: see NUTRITION.

CASEMATE, *n.* *kās'māt* [F. *casemate*, a casemate, a loop—from It. *casamatta*, a casemate—from Sp. *casamata*—from *casa*, a house; *matar*, to slay]: originally a loopholed gallery excavated in a bastion, from which the garrison could do execution upon an enemy who had obtained possession of the ditch, without risk of loss to themselves. Hence the designation, from Span. *casa*, house, *matar*, to kill. As defense from shells became more important, the term was subsequently applied to a bomb-proof vault in a fortress, for the security of the defenders, without direct reference to the annoyance of the enemy. A *casemated* battery consists of such a vault or vaults, with openings for the guns. A C. may also serve for barracks, or for a hospital, or for a store-house. The great want of ventilation in casemates renders them bad places for barracks; and the artillerymen are nearly stifled with smoke when firing from such confined places.—CASEMATED, *a.* having casemates.

CASEMENT, *n.* *kās'měnt* [a mere abbreviation of *encasement*—from *encase*—from OF. *encasser*, to case or put into a chest: comp. It. *casamento*, a large house]: frame with hinges to open and shut, inclosing part of the glazing of a window. Windows of this description are not very common in the United States and in Britain, but are almost universal on the European continent; sometimes called French windows. C. is also a name for a deep, hollow, circular molding, similar to the *scotia* of classical and the *cavetto* of Italian architecture; prevalent in the perpendicular style of Gothic architecture, and sometimes enriched with running foliage. CASEMENTED, *a.* having casements.

CASEOUS, *a.*: see under CASEINE.

CASERN, or CASERNE, *n.* *kā'zěrn* [F. *caserne*, barracks—from Sp. *caserna*—from L. *casa*, a hut]: a small sleeping-place for soldiers near the ramparts.

CASERTA, *kā-sūr'tā*: town of Italy, province of C.; on a plain about 17 m. n.e. of Naples; noted chiefly for its magnificent palace, one of the finest in Europe, formerly the frequent residence of the Neapolitan court. During 1860, C. acquired celebrity as the headquarters of Garibaldi and his army. A rival silk manufactory has been established in

the neighborhood. Pop., with adjoining hamlets (1881), 17,257; (1901) 32,709.

CASE-SHOT, or **CANISTER-SHOT**: assemblage of bullets or small balls, inclosed in a cylindrical case or canister. The diameter of this canister is a little less than the bore of the gun from which it is to be discharged. According to the size of the canister, the balls vary from $1\frac{1}{2}$ lb. to oz. each, from 30 to 280 in number, and from $3\frac{1}{2}$ lbs. to 85 lbs. in total weight. The canister bursts immediately on leaving the gun, and the balls spread out into an irregular sort of cone. Within a range of 500 yards, they work great execution among troops; they are generally used at 200 or 300 yards.

In a more modern and effective kind, called *spherical case*, the bullets are inclosed, with a charge of powder, in an iron shell, instead of a tin canister. It is often called *shrapnel shell*, from the name of its inventor. A spherical case-shot for a 68-lb. carronade, or for an 8-inch howitzer, contains 337 balls; for a 24-pounder gun, 128; and for an 18-pounder, 90. It is exploded by a fuse, the length of which depends on the distance of the point where the destructive effect is to be wrought. Its effect is something like that of a prolonged musket-fire. The shrapnel shell is not of much use against the hull of a ship; but it is very destructive against masses of men on shore, or on the decks of a ship, with a greater range than that of ordinary canister. Artillerymen prefer just such an amount of charge as will burst the sphere, without scattering the balls very widely.

CASEY, *kā'sī*, **SILAS**: 1807, July 12—1882, Jan. 22; b. East Greenwich, R. I.: general. He graduated at West Point, 1826, served in Florida and Mexico, gaining brevets for gallantry at Contreras and Chapultepec, and at the latter receiving a severe wound while leading the assault. He was commissioned lieut.col. 1855, col. 4th inf. and brig.-gen. of vols. 1861, and was employed in organizing and disciplining volunteers at Washington. He commanded a division in Keyes's corps of the Army of the Potomac, and received the first Confederate attack at Fair Oaks, 1862, May 31: for this he was made maj.gen. of vols., brevetted brig.gen. in the regular army, and afterward (1867) thanked by the R. I. legislature. He was brevetted maj.gen. United States Army, 1866, and retired from active service 1868. He died in Brooklyn.

CASH, n. *kāsh* [F. *caisse* and *casse*; It. *cassa*, a chest or counter, a merchant's cash—from L. *capsa*, a chest]: money on hand, or at command, as in a chest or in the bank; ready money; sometimes synonymous with money, as distinguished from produce, in which sense it includes all immediately negotiable paper—bills, drafts, and bonds, as well as coin and bank-notes. At other times, limited to denote coin and bank-notes, as distinguished from negotiable instruments which pass by indorsation. C. is also the name of the only Chinese coin in use. It is made of copper or brass, and has Chinese characters and a square hole in its centre for stringing—10 cash = about one cent. **CASH**, v. to turn into money;

CASH ACCOUNT—CASHEW.

to exchange for money. CASH'ING, imp. CASHED, pp. *kăsh't*. CASHIER, n. *kă-shēr'*, a clerk who has charge of the money and the cash-book. CASH-ACCOUNT, an account of advances opened by a banker to a borrower who has given security for the repayment of them. CASH-CREDIT, the privilege of drawing money out of a bank on security being given. CASH-BOOK, the book in which money paid out and received is written down.

CASH ACCOUNT', or CASH CREDIT: form of account with a bank, by which a person is entitled to draw out sums as required by way of loan to a stipulated amount. The practice began about 1729 in Scotland, with the banks of which country it is still peculiarly associated; but it is not unknown elsewhere, though on a somewhat different plan. In connection with the Scotch banks, the C. A. system is placed on a distinct and secure basis. The persons procuring a credit of this kind are for the most part retail-dealers, tradesmen, and farmers, who possess a limited capital, and need occasional loans. See MARGINAL CREDIT.

CASHEL, *kăsh'el*: town of Ireland, Tipperary county, 105 m. s.w. of Dublin by rail. It is irregularly built on the s. and e. slopes of an isolated height, rising abruptly from a rich and extensive plain. C. is a bishop's see, and returns one member to parliament. The ancient kings of Munster resided here. The top of the height, or 'Rock of Cashel,' is occupied by an assemblage of the most interesting ruins in Ireland, which have a grand effect from the country around. The ruins consist of a cathedral, the largest and most remarkable in the country, founded 1169, burned 1495, and afterward repaired; a stone-roofed chapel, built 1127 by Cormac MacCarthy, King of Munster, and the most perfect specimen of the kind in the country; Hore Abbey, founded 1260; the palace of the Munster kings; and a round tower, 90 ft. high and 56 in circumference. The round tower is built of freestone, the other ruins of limestone. At C., 1172, the great synod was held in which the Irish prelates first acknowledged the authority of the English king and church. Pop. (1881) 3,961; (1891) 4,562.

CASHEW, n. *kă-shō'* [*F. acajou*—from the native name], (*Anacardium occidentale*): tree of the nat. ord. *Anacardiaceæ*, native probably of the tropical parts of both hemispheres, although commonly regarded as of American origin. It is a spreading tree of no great height. It abounds in a clammy, milky juice, which turns black on exposure to the air, and is used in India for varnishing, but is so acrid as to produce painful inflammation when it comes in contact with the skin of some persons, or when they are exposed to its fumes. Others are comparatively unsusceptible of its influence. The fruit of this tree is a kidney-shaped nut, about an inch long, seated on the thicker end of a pear-shaped fleshy stalk, from which the botanical character of the the genus is derived. The shell is double, the outer shell ash-colored, and very smooth; and between it and the inner is a layer of very caustic black juice. The kernel is oily, and very pleasant and wholesome, and is in common use as an article of food

CASHGAR.

in tropical countries, being made into puddings, roasted, and in various ways prepared for the table. In the West Indies, it is put into wine, particularly old Madeira wine, to which it is thought to communicate a peculiarly agreeable flavor, and for this use it is sometimes exported. It is for the same reason sometimes an ingredient in chocolate. Yet the vapor which arises from it in roasting, but which is derived from the coating of the kernel, and not from the kernel itself, is so acrid as to cause erysipelas and other painful



Cashew Nut (*Anacardium occidentale*).

affections of the face in those who conduct the process, unless great caution is used.—The fleshy stalk, sometimes called the *Cashew Apple*, varies in size, being sometimes not much larger than a cherry, and sometimes as large as an orange, and is white, yellow, or red. It is perfectly free of the acidity characteristic of the natural order, is acid and eatable, very pleasant and refreshing, and much used by the inhabitants of the countries in which the tree grows. A very pleasant vinous liquor is obtained from it by fermentation; and this by distillation yields a spirituous liquor, highly esteemed for its flavor. A gum which exudes from the bark of the tree, quite distinct from the milky juice already mentioned, is bland, and very similar to gum-arabic.

CASHGAR, or KASHGAR, *kāsh-gār'*: political capital of e. Turkestan, of which khanate—independent of China from 1865–78—Yarkand is the commercial capital. C. stands 140 m. n.w. of Yarkand, lat. 39° 25' n., long. 73° 57' e. It is surrounded by an earthen rampart, pierced with four gates, and is strongly garrisoned. It has manufactures of cotton, gold and silver cloths, carpets, etc.: and extensive trade

CASHIER—CASHMERE.

with central Asia. C. lies in a rich valley, irrigated by one of the head streams of the river Tarim; its houses are mostly of clay. The city is said to have been an important commercial town before the Christian era. See TURKESTAN. Pop. estimated 80,000.

CASHIER: see under CASH.

CASHIER, v. *kă-shēr'* [Dut. *kasseren*, to cast off, to break: Ger. *cassiren*, to cashier, to annul—from F. *casser*, to break—from L. *quassārē*, to break or dash to pieces]: to dismiss from an office of trust for bad conduct; to reject or discard. CASHIER'ING, imp. CASHIERED, pp. *kă-shērd'*, dismissed; discarded. Cashiering, as a punishment for officers in the army and navy is a severe form of dismissal from the service, and implies that the officer, by some disgraceful conduct, has deserved not only dismissal, but disqualification for ever again entering the service. Sometimes there are words added, implying still deeper ignominy and degradation. On some rare occasions, when a court-martial has awarded C., the commander-in-chief has mitigated the punishment to simple dismissal. 'Scandalous and infamous conduct,' and 'conduct unbecoming the character of an officer and a gentlemen,' mark two degrees of offense which may lead, the one to C., the other to dismissal. *Note*.—Skeat refers the origin of *cashier* also to the F. *casser*, to break, to burst: mid. L. *cassārē*, to bring to nothing, to annul—from L. *cassus*, empty, void.

CASHMERE, *kăsh-mēr'*: valley of the Himalaya, between India proper and middle Tibet; between lat. 33° 15' and 34° 35' n., and long. 74° 10' and 75° 40' e. Its bottom, a comparative level of about 2,000 sq. m. is about 5,500 ft. above the sea; while the inclosure, as a whole, from ridge to ridge, besides fully doubling the area, attains, at some points, nearly thrice the altitude. The mountain-wall of this secluded region presents few passes, and most of these too lofty to be practicable in winter. In fact, the Baramula itself does not admit a wheeled vehicle. Through this single opening, at the s.w., the Jhelum carries down toward the Punjab the gathered streams and lakes of the entire basin, and is navigable for the last 70 m. of its course. This network of waters, without swelling into inundations, affords everywhere a perennial supply for irrigation. Besides the copious rains of spring, the snows of winter, covering even the plains to a depth of two ft. for four months, accumulate in every gorge and on every declivity, reservoir above reservoir, against the demands of summer. C. is traditionally believed to have been a vast upland lake, and alluvial deposits beyond the reach of existing influences seem to confirm the supposition.

In regard to climate, moderate but steady frost prevails from Nov. to March; and again, the heat, ranging from 75° in June to 85° in August, is often disproportionately oppressive, through the stagnation of the landlocked atmosphere. The staple production is rice, which, from the singular facilities of irrigation, is an almost sure crop, yielding even in an ordinary season 30 or 40 returns; and in the

CASHMERE.

abundance and excellence of its fruits, C. is said to surpass all the rest of the world. The valley is, in general, considered remarkably healthy. The inhabitants, almost universally held to be models of strength and beauty, have suffered much from famine and pestilence. The famine of 1878-9 was very severe, producing terrible mortality and distress beyond description. The people are mostly Mohammedans, divided between the Sunnite and Shiite sects. The manufactures are shawls, leather, firearms, and attar of roses. In 1315, C. first received Mohammedanism; in 1586, it was annexed to the Mogul empire; in 1752, it fell under the power of the Afghans; and in 1819, it was subjugated by the Sikhs. Lastly, being ceded, at the close of the first war of the Punjab, to the British, it was by them transferred to Gholab Sing, prince of Jamu. The maharaja is ruler not merely of C. but of Jamu, Punch, Ladakh (q.v.), Gilghit, Bulti (q.v.), Dardistan, etc.—a total area of 80,900 sq. m. He is politically connected with the Punjab, his relations to other states being controlled by the government of India; but within his own territories he is independent. The revenue of C. is about £550,000; of the whole territory, £800,000. The chief towns are Srinagar or Serinagur (q.v.), Jamu (q.v.), Le (q.v.), Islamabad, and Baramula. Pop. of total area above indicated, (1901) 2,905,578.

CASHMERE, *n.* *kāsh'mēr*: a rich and costly material for shawls: so called from *Cashmere*, the country of northern India where first made; a fine woolen stuff made in imitation of real cashmere: *ADJ.* of or pertaining to. CASHMERE GOAT, variety of the common goat, remarkable for very long, fine, and silky hair, from which the famous Cashmere shawls are made. It is found not so much in Cashmere, as in Tibet, whence the finest goat-hair is imported into Cashmere, to be there manufactured into shawls. The hair is even longer than that of the Angora goat, and not, like it, curled into ringlets, but straight. It is about 18 inches



Cashmere Goat.

long. A single goat does not yield more than three ounces, and the fleece of ten goats are requisite for the manufact-

CASIA—CASINGS.

ure of a shawl a yard and a half square. The hair is spun by women, and dyed after it is spun. It is said that 16,000 looms are kept in constant employment in Cashmere, producing annually about 30,000 shawls. The shawls are woven in rudely-constructed looms, a pair of shawls sometimes occupying three or four men a whole year in weaving. C. shawls, of the finest quality, are sold in Europe and America at from \$500 to \$2,000 each. Plain shawls are simply woven in the loom, but those with variegated patterns are worked with wooden needles, a separate needle being used for each color. These shawls are in the highest request in India; but the hair of several other breeds of goat inferior to that of Tibet is employed for the manufacture of shawls called by the same name. Imitations of these are extensively manufactured in France, some from the Tibet wool entirely, and others of a mixture of this with silk and cotton. It is said that 24 pounds of the best Tibetan goat-hair sell in Cashmere for 20 rupees, or about \$50.

Attempts have been made to introduce the C. G. into Europe. Baron Alströmer attempted, in the end of the 18th c., to naturalize it in Sweden; and a very spirited attempt to introduce it into Great Britain has recently been made by Mr. Towers. A mixed race, produced by crossing the C. G. and the Angora, has been found to possess most valuable qualities, the hair being long, fine, and more abundant than in any of the parent breeds. The male of the C. G. has very large, flattened, wavy horns.

CASIA, *kāsh'a*, or *kāsh'ī-a*, or POET'S CASIA (*Osyris alba*): shrub of the nat. ord. *Santalaceæ*, native of the s. of Europe, three to four ft. high, with linear-lanceolate deciduous leaves, long, supple branches, numerous small white flowers, and red drupes (stone-fruit) of the size of a pea. The branches are used for making crates. The shrub has been much admired for its modest beauty. Keats speaks of

‘The drooping flowers
Of whitest casia, fresh from summer showers.’

CASIMIR, *kās'e-mēr*, properly KAZIMIERZ, *kā-ze-me-ārzh'*: name of many Polish princes and kings. With the establishment of the power of Casimir I. 1040, the predominance of Christianity, was decided in Poland. But the most distinguished of this name was Casimir III., called Casimir the Great, who succeeded his father, Vladislaus Loketek, as king of Poland 1333. He added Little Russia and Red Russia to his dominions; repelled the Tatars, who then threatened Poland; and waged successful war in Silesia, which he conquered but did not retain. He showed great anxiety for the advancement of the arts and of learning in his kingdom, and for the improvement of the condition of the most oppressed classes, which won him the title of king of the peasants. A Jewish mistress obtained from him liberties for the Jews, which they have since retained in Poland. He died in consequence of the falling of his horse 1370.

CASINGS, n. plu.: see CAZONS.

CASINO—CASPIAN SEA.

CASINO, n. *kă-sē'-nō* [It. *casino*—diminutive of *casa*, a house—from L. *casa*, a cottage]: small country-house; saloon for dancing; place for social reunions. The Italian nobles have long had casinos detached from the palaces in which they live, whither they can retreat and enjoy themselves, and it is probable that the *public* casinos were the result of an imitation by the middle classes. In Italy, a C. is generally close by a theatre, and is a place where musical or dancing soirées are held, containing a conversation-room, billiard-room, and rooms for other kinds of amusement, as well as small apartments where refreshments may be had. Casinos are numerous in Italy and Germany, and have been introduced into England and the United States. In general there has been some question as to the desirableness of the influences which they exert.

CASINO, or **MONTE-CASINO**: mountain overhanging the town of San-Germano (anc. *Casinum*), in the Italian province of Caserta, between 50 and 60 m. n.n.w. of Naples: celebrated for the monastery founded here by St. Benedict (q. v.) in 529. This monastery is remarkable for its noble architecture, its ancient wealth, its library and archives, and in modern times for the learning of its monks, who have a printing-press, from which several important works have issued. The beautiful situation of the abbey, and the reputation of the monks as masters of the healing art, formerly made Monte-Casino a favorite resort of pilgrims. Luigi Tosti, the librarian of the abbey, has given an account of its literary treasures in his *Storia della Badia di Monte-Casino* (1841-43), and a most valuable catalogue (1st vol. 1874; 2d, 1876) is in preparation.

CASK, n. *kăsk* [Sp. *casco*, a vessel for holding liquids: F. *casque*, a case]: a round, close, wooden vessel for holding liquors, formed of staves and hoops.

CASKET, n. *kăsk'ēt* [dim. of *cask*: F. *cassette*, a little box, a case for jewels—from F. *casse*, a printer's case, formerly a chest or box]: a small chest or box for holding jewels, trinkets, etc.

CASOLI, *kă'sō-lē*: town of Italy, province of Chieti on a hill 17 m. s. of the city of Chieti. Pop. 3,000.

CASORIA, *kă-sō'rē-â*: town of Italy, 5 m. n.n.e. from Naples. Silk is produced in the district. Pop. 8,000.

CASPE, *kăs'pā*: town of Spain, province of Saragossa, 57 m. s.s.e. of the city of Saragossa. It is near the Ebro, has manufactures of oil and soap, and a trade in the agricultural produce of the district. Pop. 9,157.

CASPIAN SEA, *kăs'pī-an*: inland sea, or great salt-lake, largest in the world; on the boundary between Europe and Asia, extending from lat. 36° 40' to 47° 20' n., and long. 46° 50' to 55° 10' e. Its length from n. to s. is about 700 m., and its average breadth about 200 m.; total area estimated 180,000 sq. m. The coast-line is irregular, and on the e. side especially there are several bays and indentations of coast, the principal being those of Mertvoi, Mangushlak, Kenderlinsk, Karabugos, and Balkan. From the

west, the naphtha-impregnated peninsula of Apsheron stretches into the C. opposite the Balkan Gulf; Mount Caucasus also rises on its w. side. On the s. is the lofty range of the Elburz Mountains, between which, however, and the coast, on this side almost unbroken, extends a low, flat plain 15 to 20 m. in breadth. On the n. it is bordered by great steppes, and the country e. is a vast plain. It is probable that at one time its waters, which are said to be still diminishing, covered great part of the adjacent steppes. Some singular changes appear to take place in the level of the Caspian. Various measurements have made its depth and elevation different. One Russian measurement made it 348 ft. below the level of the Black Sea; another only 84 ft. The latter is confirmed by Major Wood (*The Shores of Lake Aral*, 1876). It has no tides, but its navigation is dangerous because of violent storms, especially from the s.e., by which its waters are sometimes driven for many miles over the adjacent plains. The depth near the s. end is about 600 ft. and in some places near the centre it attains a depth of nearly 3,000 ft.; but near the coast it is very shallow, seldom reaching a depth of more than three ft, at 100 yards from the shore, and in many places a depth of 12 ft. is not reached within several miles of the beach. On the n.e. and e. especially it is shallow. It receives the waters of a number of large rivers, of which the greatest is the Volga. The Ural, the Terek, the Kur, and the Atrek also fall into it. The water of the C. S. is salt, but much less so than that of the ocean. Its n. parts are covered with ice during winter. It abounds in fish, and very valuable fisheries are carried on, especially for sturgeon and salmon. By a canal uniting the head-waters of the Volga with the rivers Tvertza and Schlina, the C. is united with the Baltic Sea. The sea is now surrounded on three sides by Russian territory, the s. shore still remaining Persian. The Russians have a fleet upon it, and lines of steam packets. The chief Russian towns upon its shores are Astrakhan, Derbend, Baku, and Krasnovodsk (q. v.), from near which a railway runs by Askabad toward Merv. Balfrush, Reshd, and Astrabad are Persian towns. The practicability of making the Amu-Daria (see OXUS), now running into the Sea of Aral, again an affluent of the C. S., has recently been much debated.

The C. S. was known to the Greeks and Romans, According to Strabo, it derived its name from the Caspii, a tribe inhabiting its western shores. The name Caspian was afterward limited to the w. portion of the lake—the e. being designated by the Hyrcanian Sea.

CASQUE, n. or CASK, n. *kăsk* [F. *casque*, a helmet—from Sp. *casco*, a helmet, a cask]: a helmet or head-piece for a soldier: see HELMET.

CASS, LEWIS: 1782–1866, June; b. Exeter, N. H.: statesman. He was educated for the law, but quitting that profession, he entered the army, 1812, and rose rapidly to the rank of general, though his merit was not very conspicuous. In 1813, he was elected gov. of Michigan, in

which state he had settled. During his governorship, he kept himself apart from party politics, yet all his measures had a decidedly democratic tendency. In 1831, C. was made minister of war under General Jackson, and in 1836 he was sent as plenipotentiary to Paris. In this capacity he made himself popular by his replies in *Galvani's Messenger* to the attacks of the English press on the claims of the union with regard to its n.e. boundaries, and by his protest against the measures of Guizot; but the treaty concluded by Daniel Webster with Lord Ashburton was so much opposed to the views maintained by C., that he resigned his post, and in 1843 returned to America, where he was received with popular favor. He now aimed at the presidency, and in 1844 was put in nomination, but was defeated, as also in 1848, when he was again nominated. In 1857 he was appointed sec. of state, resigning office in 1860. Though active and energetic he had no claim to comprehensive statesmanship. In regard to slavery his conduct was ludicrously inconsistent, and seems to have been determined by a view to what would be popular with those whose favor he was seeking at the moment. Latterly he went wholly with the slave holding party, advocating an extension of territory with a view to extend the ramifications of slavery. He was noticeable for his bitter hostility to Britain, against which he was ever ready to inflame the minds of his countrymen. He is the author of the *History, Tradition, Languages, etc., of Indians in the United States*; of *France: its King, Court, and Government*; and other works.

CASSABA, *kás-sá'bá*, or CASABA, *ká-sá'bá*: town of Asia Minor, 63 m. e. of Smyrna, and connected with it by railway. It is supplied with water by an ancient aqueduct two or three m., away, and the ruins of Sardis are within 21 m. The surrounding country raises and exports melons, silkworms, and cotton; the town has four ginning factories. C. suffered from fire and cholera 1865. The Greek language is largely used. Pop. abt. 15,000, two-thirds Turks.

CASSAGNAC: see GRANIER DE CASSAGNAC.

CASSAN'DER, King of Macedonia: B.C. 354–297 or 296; son of Antipater. When young he is said to have been ill used by Alexander the Great, and to have consequently conceived a mortal hatred to that monarch's family. On the death of his father, he expected to succeed to the regency; but Polysperchon received the honor instead, which so dissatisfied him that he resolved to contest the sovereignty with his opponent. He was completely successful; but while pursuing his career of conquest in the s. of Greece, he learned that Olympias, mother of Alexander, was committing havoc in the n., and consequently hurried back to Macedonia. In less than a year Olympias was taken prisoner and put to death. Only Roxana, wife of Alexander, and her son Ægus, now stood between him and the throne of Macedon; but he did not find it convenient to 'make away' with these two until several years had passed. Meanwhile, he married Thessalonica, half-sister to Alexander, in whose honor he founded, about B.C. 316, the town which

CASSANDRA—CASSANO.

bears her name. In the following year he caused Thebes, which Alexander had destroyed, to be rebuilt. He next became involved in a war with Antigonos, King of Asia, which, with an intervening peace of one year, lasted from B.C. 315–301, in the last of which years Antigonos was defeated and slain at the battle of Ipsus. With his auxiliaries Seleucus, Ptolemy, and Lysimachus, he seized and shared the dominions of the vanquished. The rest of C.'s life was spent in intrigue and military enterprise.

CASSANDRA, *kās-sân'drâ*: peninsula in the province of Roumelia, European Turkey; between the Gulfs Salonica and Cassandra; lat. 40° n., long. 23° 30' e. The ancient name of this headland was *Pallene*. Grain of superior quality is raised here; wool, honey, and wax are produced; and silk-worms are extensively reared.

The gulf of Cassandra (anc. *Toronaicus Sinus*) has a length of 33 m. from s.e. to n.w., and a breadth of 10 m.

CASSANDRA, n. *kās sãn'dră* [the daughter of Priam who had the gift of prophecy, but, through the influence of Apollo, no one believed her predictions]: one whose predictions no one believes.

CASSAN'DRA: according to Homeric legend, the fairest daughter of Priam and Hecuba, and twin-sister of Helenus. The children playing in the court of the temple of the Thymbraean Apollo, not far from Ilium, till it was too late for them to return home, a bed of laurel-twigs was made for them in the temple; and there, in the morning, two snakes were found licking their ears, from which resulted such an acuteness of hearing, that they could hear the voice of the gods. C. afterward attracted the love of Apollo by her beauty, and he taught her the secrets of prophecy; but displeased by her rejection of his suit, laid upon her the curse that her vaticinations should never be believed. Accordingly she prophesied in vain of the treachery of the Grecian horse and the destruction of Troy. On the capture of the city she fled to the temple of Minerva, but was torn from the altar by the Locrian Ajax, and ravished in the temple. She afterward, in the distribution of the captives, fell to the share of Agamemnon, to whom she bore twin sons, but was murdered by Clytemnestra.

CASSANO, *kās-sâ'nō*: town of Italy, province of Cosenza, 34 m. n. of the town of that name. It is in a valley in the midst of beautiful scenery, has a cathedral, an old castle built on an imposing mass of rock in the midst of the city, and manufactures of linen, leather, silk, cotton, and macaroni. Pop. 8,000.

CASSANO: town of n. Italy, 17 m. e.n.e. of Milan. It is situated on the right bank of the Adda, here crossed by a bridge on the railway to Brescia, and has extensive silk-mills. C. was the scene of two sanguinary battles—one in 1705 between the French under the Duke de Vendôme, and the imperialists under Prince Eugene, in which the latter were defeated; the other in 1799, when the Russians and Austrians under Suwarow defeated the French under Moreau. Pop. 4,500.

CASSATION.

CASSATION, n. *kās-sā'shŭn* [F. *cassation*—from *casser*, to break down, to make void: comp. Lat. *quaterere*, Eng. *quash*]: the act of repealing or annulling. COURT OF CASSATION, the highest court of appeal of France. But as everything is excluded beyond the question whether or not the view taken of the law, and of the proper method of administering it by the inferior tribunal, has been the right one, the idea attached to this institution is less that of a court in the ordinary sense than of a dept. of government to which the duty of inspecting the administration of justice is assigned. By the 65th article of the constitution of the year VIII., it was enacted that there shall be 'for the whole of France a tribunal of cassation, which shall pronounce on demands for cassation against judgments in the last resort pronounced by the tribunals;' and the following article of the same constitution bears that this supreme tribunal shall pronounce no judgment on the foundation or merits of the cause, but that, in case of its breaking the judgment pronounced, it shall remit to the tribunal appealed from to pronounce another. The title of tribunal was afterward changed for that of court, by a *senatus consultum* of the year XII.; but substantially the institution has retained its original character, notwithstanding the changes of government. The demand for cassation can be made only by the parties to the suit, or by the *procureur-général* of the court of C. for the public interest. Criminal as well as civil judgment may be reviewed by the court of C., the only exceptions being the judgments of justices of the peace and of courts-martial, military and naval. The delay allowed for bringing a civil case before the court of C. is three months for persons domiciled in France, six months for those in Corsica, a year for American colonists, and two for all persons resident beyond the Cape of Good Hope. In criminal matters the procedure is greatly more prompt, three full days only being allowed to the person condemned to bring his action of C., and the same space being given to the *procureur-général*. In all criminal and police cases the court of C. may pronounce judgment immediately after the expiry of these days, and must do so within a month. The court of C. is divided into three sections, one of which is devoted to criminal matters. Its staff consists of a president, who has the title of *first* president, and three vice-presidents, who are called presidents; 45 counselors or ordinary judges; a *procureur-général*, or public prosecutor; six substitutes, who have the title of advocates-general; and several inferior officers. The presidents and counselors are named by the sovereign for life, the other officers being removable at pleasure. No judgment can be pronounced unless 11 judges are present, the decision being determined by the majority. Where the numbers are equally divided, five judges are called in; and cases of peculiar difficulty may be judged of by the three sections united. The whole court, when presided over by the minister of justice, possesses also the right of discipline and censure over all judges for grave offenses, not specially provided for by the law. When thus constituted, the court of C. may suspend the judges of the

imperial courts from the exercise of their functions, and call them to its bar. The procureur-général of the court of C. likewise possesses a surveillance over the procureurs-généraux of the imperial courts.

The members of this august tribunal wear a red gown with a violet *toque*, or cap of velvet; the robes of the presidents and of the procureur-général being doubled with white fur.

CASSAVA, *kās'sa-vá*, or CASAVA' (q.v.): West Indian name of the plant called MANIOC (q.v.), and of the starch produced from it, which is otherwise called Brazilian arrow-root, and is popularly known as TAPIOCA (q.v.).

CASSAY, *kās-sā'*, or MANIPUR, *mǎn-e-pór'*: native state in n.e. India, between Assam and independent Burmah. It is dependent on Britain, has a British political agent, but pays no tribute. Area, 8,000 sq. m. The people are partly Manipuris (of Mongolian extraction), and partly wild hill tribes, Lushais, Kukis, Nagas, etc. The people of the fertile valley of Manipur are chiefly Hindus, with some Moslems; the wild tribes of the hill country, pagans. There is little trade, roads being useless for carts. Imports are betel-nut, cloths, hookahs, spices, and tools: exports are ponies, cloth, silk, beeswax, tea-seed, ivory, and india-rubber. Before the Burmese war of 1825, C. was occupied by the British; and, being permanently ceded at the close of the contest, it was handed over to the native rajah. The chief town is Manipur, also spelled Munnipore. Pop. of C. 140,000.

CASSEL, *kās'sel*: capital of the former electorate of Hesse-Cassel, now a portion of Prussia, pleasantly situated on both sides of the Fulda, here a navigable river, 120 m. by rail, n.n.e. of Frankfurt-on-the-Main. The oldest part of the town consists of a few very narrow, crooked streets, close on the banks of the Fulda; the more modern parts are on hills, which rise gently from the river. C. is partially walled. In Friedrichs-Platz, the largest square in any German town, stands the elector's palace, a comparatively mean structure: a little below is the first story of a magnificent palace commenced in 1820, and stopped in the following year by the death of the elector who projected it. Among public buildings and institutions, one of the most important is the *Museum Fredericianum*, which has a library of 90,000 vols. and some valuable MSS. The picture-gallery contains about 1,400 paintings, including excellent specimens of the best masters. In the cabinet of curiosities are examples showing the gradual development and improvement of watchmaking from the earliest invention at Nuremberg to the present time. C. contains an observatory, and is the seat of a number of learned and scientific associations. From 1807-13 it was cap. of the kingdom of Westphalia. The gardens of Wilhelmshöhe—which was assigned by William I. of Germany to the late Emperor Napoleon as a residence after his fall at Sedan, 1870, Sep.—with their splendid fountains and cascades, and the colossal statue of *Hercules*, within the hol-

CASSEL—CASSIA.

low of whose club eight persons can stand at one time, are only three miles from Cassel. There are manufactures of cotton, woollen, and silk fabrics, lace, and carpets. Under the name of *Chassala*, the town appears to have existed as early as the 10th c. Pop. (1885), including military with servants and laborers, 64,083; (1900) 106,034.

CASSEL, *kās-sěl'*: town of France, dept. of the Nord, 27 m. n.w. of Lille; known to the Romans, who had a station here, as *Castellum*. It is pleasantly situated on a hill, overlooking a country on all sides so flat, that the view, although the elevation is only 800 ft., is said to be one of the widest in Europe, extending over the broad fertile plains of Flanders, and to the chalk cliffs of England, and taking in 32 towns and 100 villages. During the great trigonometrical survey undertaken in the reign of the first Napoleon, Mont Cassel was one of the chief signal stations. C. has manufactures of lace, linen, thread, hosiery, etc. Pop. about 3,200.

CASSIA, n. *kăsh'î-ă* [L. and Gr.]: 1. name given by the ancients to a kind of medicinal bark, but their descriptions are so imperfect that it is impossible to determine what bark it is. In the English translation of Ex. xxx. 24, and Psa. xlv. 8, the name is from the Septuagint; and probably the substance intended is the same now known as *Cassia bark*, or *Cassia lignea*.

2. *Cassia* is now the botanicaal name of a genus of plants of the nat. ord. *Leguminosæ*, sub-order *Cesalpineæ*, containing many species—more than 200 having been described—trees, shrubs, and herbaceous plants, natives of Africa and of the warm parts of Asia and America. They have abruptly pinnate leaves, and flowers with deciduous calyx of five somewhat unequal sepals, corolla of five petals, of which the lower ones are the larger, ten free stamens, of which three are long, four short, and three abortive, and anthers opening by two holes at the top. The leaves and pods of many species have a peculiar sweetish but nauseous smell, and a nauseous, bitter taste accompanied with a loathsome sliminess. They seem all to contain the purgative principle called cathartine (q.v.), and the leaves of some of the Asiatic and African species are highly valued, and much used as a medicine, under the name of SENNA (q.v.). The leaves of *C. Marylandica* possess similar properties, and are now used to some extent in the United States. *C. Fistula* (*Cathartocarpus*) yields the C. of the pharmacopœias, the *C. pods*, *Pipe C.* or *Purg-ing C.* of the shops. It is a large tree, native of Egypt and other parts of Africa; perhaps also of the East Indies, in which it is now widely diffused and cultivated, as well as in the West Indies and warm parts of America. Its leaves have four to six pair of ovate smooth leaflets; its flowers are yellow and in loose racemes; its pods, which have obtained for it the name of *Pudding-pipe Tree*, are sometimes two ft. in length, cylindrical, black, consisting of thin, brittle, woody valves, within which is a cavity divided by numerous thin transverse partitions, each cell containing a single

seed imbedded in a soft black pulp. It is this pulp that is the part used in medicine; it has a sweetish, mucilaginous taste, and in small doses is a mild laxative. It is sometimes removed from the pods when fresh; or an extract is obtained after they are dried by boiling and evaporating. It is said to contain 61–69 per cent. of sugar. The *C.* pods of the West Indies contain much more pulp, and are therefore more valuable than those imported from the East.

3. *C. Bark*, or *C. lignea*, sometimes called *China Cinnamon*, is a bark very similar to cinnamon both in appearance and properties, but in thicker pieces, and less closely quilled, of a less sweet and delicate flavor, but more pungent. It is the produce of the *Cinnamomum Cassia* or *aromaticum*, a tree of the same genus with the Cinnamon-tree, native of China, extensively cultivated there. It is highly esteemed by the Chinese, and is now largely imported into Europe. As it contains a greater proportion of essential oil, and is also much cheaper than true cinnamon, it is much more generally used. The oil which it contains is called *Oil of Cassia*, and is very similar to oil of Cinnamon. Coarse cinnamon is sometimes sold as cassia. *C. Buds* are believed to be the dried flower-buds of the same tree which yields *C. bark*. In flavor and other qualities, they resemble *C. bark*; in appearance, they are very similar to cloves. They are used in confectionery.

CASSIANUS, *kas sî-ā'nus*, JOANNES, or JOANNES MASSILIENSIS, or JOANNES EREMITA: Christian teacher in the early part of the 5th c.; died after 433: distinguished promoter of monachism in southern Gaul, and opponent of the extreme dogmas of St. Augustine respecting grace and free-will. Shortly before 415 he went to Massilia (Marseille), where he founded two monasteries according to the rules laid down in his *De Institutis Cœnobiorum*. One of these monasteries was for nuns; the other was the famous Abbey of St. Victor, which under C. is said to have had not less than 5,000 inmates, and which served as a model to a multitude of monastic institutions in Gaul and Spain. His *Collationes Patrum Sceticorum* is a work in 24 chapters, each of which gives a 'spiritual colloquy between monks in the desert of Sketis,' regarding the monastic life, and the vexed questions of theology. C.'s Grecian erudition, his dislike of dogmatic subtilties, and his zeal for monastic habits, led him to oppose the doctrines of St. Augustine on works and grace, and to set up a doctrine which was known by the schoolmen as 'semi-pelagianism' see PELAGIANISM. As C.'s doctrine gained support from the Massilian monks, St. Augustine, having been informed of it by his friend Prosper of Aquitaine, wrote strongly against it, especially in his treatise *De Gratia et Libero Arbitrio, contra Collatorem*. It is not known when C. died. The first collected edition of the various works attributed to him was published at Basel, 1559; the best at Frankfurt, 1722. The best account of his life and writings is by Wiggers, *De Johanni C.* (Rostock, 1824–5)

CASSICAN, *kās'si-kan* (*Cassicus*): genus of birds allied

to starlings, having an exactly conical bill, thick at the base, and extremely sharp pointed, the commissure forming an angulated line, the bill ascending on the forehead, and encroaching circularly on the plumage. They all are American birds of gregarious habits, feeding both on fruits and on insects, and 'exhibiting such surprising skill and ingenuity in the structure of their nests that an old lady once gravely asked an American ornithologist whether he did not think they might be taught to darn stockings!' The Crested C., or Crested Oriole (*C. cristatus*), is a native of Brazil, Guiana, and Paraguay. It is about 20 inches long, is sometimes seen in flocks of 50 or 100, and constructs its nests by knitting together shreds of a thin bark, *Tillandsias*, etc. The nest is about 36 inches long, and resembles a purse or pouch, the lower end hemispherical, and ten inches wide, and is suspended from the extremity of a branch of a tall smooth-stemmed tree on the outskirts of a forest, apparently to insure safety from monkeys and serpents. Several of these nests are often attached to the branches of the same tree.

CASSIDARIA, *kās-si-dā'ri-a*: genus of mollusks—class *Gasteropoda* (q.v.), ord. *Pectinibranchiata*—with univalve shells, generally regarded as belonging to the family *Buccinidae* or Whelks (q.v.), but as forming a connecting link with the family *Muricidae* (see MUREX). The shell is ventricose, with a moderately elevated spire, the aperture elongated, and the canal recurved, but not very abruptly—much less so than in the nearly allied genus *Cassis* (see HELMET SHELL)—the columellar lip covered with a plate, and the outer lip similarly margined within. The recent species, which are not numerous, belong to tropical and subtropical seas. Fifty fossil species have been described. The genus appears first in the Upper Cretaceous measures, where a single species occurs. In the Eocene 11 have been found, and about 40 in the Pliocene. It has its fullest development as a recent shell, no less than 70 species being known.

The name *Cassidarie* is sometimes given to a family of coleopterous insects, of which the type is the genus *Cassida*: see TORTOISE BEETLE.

CASSIDEOUS, a. *kā-sīd'ī ūs* [L. *cassidem*, a helmet] in bot., having one large helmet-shaped petal or sepal, as the aconite.

CASSIDONY, n. *kās'sī-do-nī* [F. *cassidoine*; L.L. *cacedonius*—from *Chalcedon*, a town in Bithynia]: a species of *Lavender stæchas*, or French lavender, a species of *Gnaphalium*, cottonweed, cuttweed, or goldylocks.

CASSIN, *kās'in*, JOHN: 1813, Sep. 6—1869, Jan 10; b. near Chester, Penn., of a Quaker family: ornithologist: his uncle and great-uncle were commodores in the U. S. navy. He removed to Philadelphia 1834, became an active member of the Acad. of Nat. Science, and after 1844 contributed largely to its *Proceedings* and *Journal*. He supplied the ornithology of the *Iconographic Encyc*, 1851; of the United States exploring expedition, 1855; of those to Chili and Japan, and of the Pacific railroad explorations and surveys. His *Illustrations of the Birds of California and Texas* appeared

CASSINI.

1855. His *Amer. Ornithology* (1856) had 50 colored plates of species not described by Audubon.

CASSINI, *kás-sē'nē*, GIOVANNI DOMENICO: 1625, June 8—1712, Sep. 14; b. Perinaldo, near Nice: astronomer. He studied at the College of Jesuits, Genoa. In 1650 he was appointed to the astronomical chair in the Univ. of Bologna. His first work related to the comet of 1652. He subsequently applied himself to the determination of astronomical refraction, and of the sun's parallax, etc. In 1664-5 he determined the period of Jupiter's rotation. Afterward, he determined the periods of the planets Mars and Venus, as also of the *apparent* rotation of the sun. He it was who discovered the third and fifth satellites of Saturn, and afterward the first and second, as well as the dual character of that planet's ring. He was also the first who carefully observed the zodiacal light; he demonstrated that the axis of the moon was not (as had been believed) at a right angle to the ecliptic, and explained the cause of the phenomena known under the name of lunar libration. One of his finest observations was the coincidence of the nodes of the moon's equator and orbit. C. died at Paris, whither he had gone in 1669, at the invitation of Colbert to take charge of the observatory erected by that minister.

CASSINI, JACQUES: astronomer: 1677, Feb. 18—1756, Apr. 16; b. Paris; son of Giovanni Domenico C. In 1694 he was elected a member of the Acad. of Sciences. He travelled in Italy, Holland, and England, where he formed the acquaintance of Newton, Halley, Flamsteed, etc., and was elected a member of the Royal Soc. of London. On the death of his father, he succeeded to the charge of the observatory at Paris. C. wrote several treatises on electricity, the barometer, etc. In his treatise, *De la Grandeur et de la Figure de la Terre* (Par. 1720), he attempted to show that the earth must be a spheroid elongated at the poles. The Newtonians denied this as opposed to the ascertained facts of gravitation and rotation, which necessitated the earth's being a spheroid flattened at the poles. As an observer, C. was eminently successful. He determined the periods of rotation of all the satellites of Saturn then known, the inclination of the planetary orbits, the obliquity of the ecliptic very nearly, and the length of the year, etc.

His son, CÆSAR C., also was engaged in scientific pursuits.

CASSINI, JEAN DOMINIQUE, Comte DE: geographer and astronomer: 1748, June 30—1845, Oct. 18; b. Paris; son of Cæsar C. He succeeded to the charge of the observatory, and completed in 1789 the great topographical map of France, begun by his father. But it having been decreed in 1793 that the observatory should no longer be in the hands of one person, three others were elected to the superintendence of it with C., whose conduct on learning this fact might suggest that he had a greater regard for his own dignity than for the whole stellar universe. He refused to have anything more to do with astronomical science, and obstinately kept his purpose through a life that lasted nearly a century. In his 95th year he published a small volume of poems.

CASSINO—CASSIOPEIA

CASSINO, *kās-sē'nō*: a game which probably originated in Italy or Germany, and took its name from the casinos or club-houses. Four cards are placed on the table, and four dealt to each player, of whom there are usually four. The greatest number of cards counts three to the holder; of spades one; the ten of diamonds two, or great C; the deuce of spades one, or little C., and each of the aces one; the whole game is 21. The object is to take as many cards as possible by making combinations; a ten in the player's hand will take ten from the table, or any number of cards that can be combined into ten. Another element of the game is 'building,' i. e., adding the numbers of different cards in one's hand to make up a number required. It is sometimes carried to 'progressive building,' which, however, is generally considered irregular. There is a variation of the game, making it more intricate and greatly enlarging the number of combinations, in which the knave counts 11, the queen 12, the king 13, and the ace one or 14, as may be determined by the players.

CASSIOBERRY, n. *kās'sī-o-bēr-rī* [mod. L. *cassine*—from the native name; Eng. *berry*]: the fruit of the *Viburnum lavigatum*.

CASSIODORUS, *kās-sī-ō-dō'rūs*, or (according to several MSS.) **CASSIODO'RUS**, *-rī-us*, **MAGNUS AURELIUS**: abt. 468—abt. 568; b. Seylaeeum (now Squillace), in Calabria: Latin writer, distinguished by his erudition in an age of barbarism. He was of a noble Roman family, and soon attracted the attention of Odoacer by his superior abilities and accomplishments. Under this monarch he held various offices, but after the defeat and murder of Odoacer by Theodoric the Ostrogoth, he passed into the service of the latter. The highest honors now fell upon him; and for years he administered the Ostrogothic power with remarkable prudence and success. In his 70th year, however, he withdrew to Calabria, where he founded the monastery of Viviers, and employed himself and the other monks in the invaluable work of copying classical MSS.; his great desire being to improve the education of the clergy. Besides his grammatical and rhetorical manuals, which were used as textbooks during the middle ages, he wrote a very important work, entitled *Variarum Epistolarum Libri XII*. This is a collection of state-papers, and is, in fact, the most extensive and the most trustworthy source of information extant in regard to everything connected with the Ostrogothic rule in Italy. The style is very peculiar, showing the influence which the political career of C. had exercised on his language and modes of thought. The *editio princeps* of the *Variarum* was printed at Augsburg 1533.

CASSIOPEIA, n. *kās'ī-ō-pē'yā* [after the mythical wife of Cepheus]: the *Lady in her Chair*; constellation in the n. hemisphere, near Cepheus, and not far from the north pole, on the side opposite that of the Great Bear. It is marked by five stars of the third magnitude, forming a figure like an M. A line from Capella to the bright star in Cygnus passes nearly through the middle of this M. Cassiopeia, according to Flamsteed, contains 55 stars, all of small mag-

CASSIQUIARE—CASSIUS.

nitude. The figure is that of a woman sitting in a chair with a branch in her hand. In the year 1572, there suddenly appeared in C. a new star, noticed first by Tycho Brahé, Nov. 11, when its lustre exceeded that of all the fixed stars, and nearly equalled that of Venus. The star gradually diminished in lustre, from the time of its being observed until it disappeared, 1574, March. It is said to have alarmed all the astronomers of the age. Tycho Brahé wrote a treatise on it, and supposed—without good reasons—that it had previously appeared in 945 and 1264. Sir John Herschel suggested the possibility of its reappearance in 1872, but his suggestion was not verified.

CASSIQUIARE, *kās-sē-kē-ā'rā*, or CASSIQUIARI, *kās-sē-kē-ā'rē*: river of Venezuela, S. America, the s. bifurcation of the Orinoco, which it leaves in lat. $3^{\circ} 10'$ n., long $66^{\circ} 20'$ w., and after a rapid s.w. course of about 130 m., joins the Rio Negro in lat. $2^{\circ} 5'$ n., long $67^{\circ} 40'$ w. About 100 yards in breadth when it issues from the Orinoco, it gradually increases until at its union with the Rio Negro it attains a width of 600 yards. By means of this singular river, water communication is established, through the Amazon, Orinoco, and their affluents, between the interior of Brazil and the Caraccas in Venezuela.

CASSIS, *kă-sē'* [F., the black currant-tree]: French liqueur prepared from black currants; the manufacture has recently become of great importance: see CURRANT.

CASSIS: see HELMET-SHELL.

CASSITERIDES: see SCILLY ISLES.

CASSITERITE, n. *kăs'sīt'ēr-īt* [Gr. *kassit'ēros*, tin]: the oxide of tin, being the ordinary tin ore; tin-stone: see TIN.

CASSIUS, *kash'e-us*, LONGINUS CAIUS: one of Cæsar's assassins: d. B.C. 42. At the breaking out of the civil war, though a tribune of the plebs, he sided with Pompey and the aristocratic faction against Cæsar. He was taken prisoner by the latter, who pardoned him, and even made him one of his legates. In B.C. 44, through the influence of Cæsar, he was made *prætor peregrinus*, and was promised the governorship of Syria in the following year. But his mean and jealous spirit could not endure the burden of gratitude imposed upon him by the generosity of the dictator, and he resolved to be released by the murder of his benefactor. Having attached to himself the mutinous spirits among the subjugated aristocracy, and also won over M. Brutus, the pseudo-patriotic conspiracy was soon matured, and, B.C. 44, Mar. 15, Cæsar fell by the daggers of assassins. The result of this bloody deed was not what C. had expected. The popular feeling—as witnessed by the riots that broke out at Cæsar's funeral—was strongly against the murderers; and the military power fell into the hands of Mark Antony. C. therefore fled to the east, and made himself master of Syria. Afterward he united his forces with those of Brutus, and, having greedily plundered Asia Minor, they crossed the Hellespont in the beginning of B.C. 42, marched through Thrace, and took up a superior

CASSIUS—CASSOWARY.

position near Philippi, in Macedonia. Here they were attacked by Antony and Octavian. The division commanded by C. was totally routed, though, on the other hand, Brutus succeeded in repulsing the troops of Octavian. C., supposing that all was lost, compelled his freedman, Pindarus, to put him to death. C.'s wife, half-sister of Brutus, survived him upward of 60 years. She died in the reign of Tiberius, A.D. 22.

CASSIUS, PURPLE OF: coloring substance of very ancient use, prepared by adding a mixed solution of protochloride and bichloride of tin gradually to a solution of chloride of gold, when a more or less abundant precipitate of the double stannate of gold and tin ($\text{AuO}, \text{SnO}_2 + \text{SnO}, \text{SnO}_2$) is thrown down. The purple of C. is soluble in ammonia, yielding a very pretty purple solution, from which it can again be obtained, with solid form unchanged, by evaporating the ammonia. Mixed with borax, or some fusible glass, purple of C. is employed by the potter to communicate a rich purple or rose tint to the better kinds of china, and it also imparts the red color of the kind of glass known as *Bohemian glass*.

CASSIVELAUNUS, *kas-sĭ-ve-law'nŭs*: British chief, who fought against Cæsar during his second invasion of the island, B.C. 54. He ruled the country n. of the Thames, and had great reputation as a warrior, but his capital was taken by the Romans, and he himself compelled to flee. He afterward sued for peace, which he obtained, on condition of paying tribute and giving hostages.

CASSOCK, n. *kās'sōk* [F. *casaque*—from It. *casacca*, a man's long gown: Gael. *casag*, a long coat]: long loose coat, formerly in common wear, but now usually worn only by clergymen under the surplice or pulpit-gown. As worn by the clergy of the Church of England, it is a long coat with a single upright collar. Black is the common color for all orders of the clergy, but on state occasions bishops frequently wear purple cassocks. In the Rom. Cath. Church, cassocks vary in color according to the dignity of the wearer—priests wearing black, bishops purple, cardinals scarlet, and the pope white. **CAS'SOCKED**, a. *sōkt*, clothed with a cassock.

CASSOWARY, n. *kās'sō-wā'rĭ* [the Malay name *kassuwaris*], (*Casuarius*): genus of birds nearly allied to the ostrich (see **BREVIPENNES** and **OSTRICH**), but distinctively characterized by still shorter wings, by a laterally compressed bill, by a bony crest, by pendent wattles on the naked neck, and by three toes on each foot, all furnished with claws, the inner toe short, and armed with a very long and sharp claw. There are also very important anatomical differences in its digestive organs, which are not adapted to the same coarse diet, for the C. 'has short intestines and small coeca, lacks the intermediate stomach between the crop and gizzard, and its cloaca does not proportionally exceed that of other birds.' There are about ten species of C., the best known of which is *Casuarius galeatus*, native of New Guinea, the Moluccas, and other Asiatic islands. Most of the other species are in-

CAST.

digenous to New Guinea; the *C. Australis* is a well-distinguished Australian form. In general appearance, the cassowary is like the ostrich, but has a much shorter neck. It is the largest known bird, except the ostrich, and its height, when erect, is about five ft. It feeds on fruits, eggs, and succulent herbage. When attacked it defends itself by kicking obliquely backward with its feet, and by striking with its short wings, the rigid barbless shafts of which, though useless even to aid it in running, are not without value as



Cassowary.

Weapons. There are only about five of them in each wing, somewhat resembling the quills of a porcupine; and at the end of the last joint of the wing there is a spur. The color of the *C.* is brownish black; the feathers are loosely webbed, and hang down, so that, at a little distance, the bird seems clothed with hair. Those of the rump are 14 inches long, hanging down in place of a tail. The head and upper part of the neck are naked and of a bluish color, and there are two pendent wattles, partly red and partly blue, on the front of the neck. On the breast is a callous bare part, on which the bird rests its body on the ground. The bony crest or helmet reaches from the base of the bill to the middle of the crown, and is about three inches high, exhibiting the most intense blue, purple, and scarlet blended together. The *C.* lays a few eggs, which it leaves to be hatched by the heat of the sun; and which are greenish, and have a much thinner shell than those of the ostrich. Its flesh is black, tough, and juiceless. The *C.* is frequently seen in menageries in Europe and America, but is becoming more rare in its native regions, in which it is sometimes kept tame.

CAST, v. *käst* [Icel. *kasta*; Dan. *kaste*, to cast: Sp. *cascar*, to crack, to burst: F. *casser*, to break—from L. *quassāre*, to break: It. *cascare*, to fall]; to crack and throw out, as some seed-vessels their seeds when ripe; to throw or

CAST—CASTAGNO.

fling; to put or place; to sow seed; to reject; to compute or reckon; to contrive or plan; to mold or shape; to ponder or weigh, as in the mind: N. a throw; the distance passed by a thing thrown; a glance or a turn of the eye; chance or hazard; a form or shape; a tinge; manner; whatever is run into a mold; a gut-line to which hooks are attached in angling. CAST'ING, imp. ADJ. deciding, as a vote: N. a molding; the act of running into a mold, as molten metal (see FOUNDRY). CAST, pt. and pp. To CAST ABOUT, to contrive; to consider carefully. To CAST ANCHOR, to let it drop into the water. To CAST ASIDE, to dismiss or reject. To CAST AWAY, to reject; to lavish. To CAST BY, in *OE.*, to reject or dismiss; to throw aside. To CAST DOWN, to deject or depress. To CAST FORTH, to throw out; to exhale. To CAST OFF, to discard, or to put away. To CAST OUT, to reject; to throw or turn out; in *Scot.*, to fall out; to quarrel. To CAST PEATS, to dig them in proper shape. To CAST UP, to compute; to reckon; to eject or vomit; in *Scot.*, to appear unexpectedly; to throw in one's teeth; to reproach. To CAST ON, to put or place on, as loops of worsted on wires. To CAST ONE'S SELF ON, to resign or yield to the disposal of, without reserve. To CAST IN THE TEETH, to upbraid; to blame for. To CAST IN ONE'S LOT WITH ANY ONE, to take the chance; to share the fortune. THE CAST OF A PLAY, the company of actors to whom the parts are assigned. LAST-CAST, all ventured on one effort. CAST-IRON, iron melted from the ore, and run into molds—called also PIG-IRON or CAST-METAL: CAST-STEEL: see STEEL. CASTING-VOTE, a vote that decides, when the votes are equally divided.

CAST, *kást*: impression produced by pouring a ductile substance, such as plaster of Paris, into a mold. This method was employed by the ancients in multiplying not only objects of art, such as the small household statues of the gods but articles of direct utility. The so-called *Celts*, or chisels of bronze, which, with the molds for casting them, are found in England, Ireland, and France, testify to the fact that the art of casting from a mold is one of the earliest acquired by semi-civilized nations. Casts of sculptures are of great value in familiarizing the eyes of those who can never look on the originals with the grand and beautiful forms of antique art. None are superior to those executed, and sold on application, at the British Museum. Casting, applied to metals, is called founding (q.v.)

CASTAGNO, *kás-tán'yo*, ANDREA DEL: 1390–1457, Aug.; b. Castagno, in dist. of Mugello, Tuscany: painter. He is said to have been tending cattle in the fields when he attracted the attention and patronage of Bernardetto de' Medici, who had him educated at Florence; here he imitated Masaccio and the naturalists. He was commissioned, 1435, to paint in the Podesta's palace the fallen leaders of the Peruzzi and Albizzi, and thence was called Andrea degl' Impiccati, 'of the hanged ones.' Most of his works have perished, but his equestrian figure of Nicola di Tolentino, in the cathedral of Florence, remains. C.'s fame suffered

CASTALDI—CASTAÑOS.

for four centuries under the charge of murdering, to secure a professional secret, Domenico Veneziano, who really survived C. four years.

CASTALDI, *kās-tāl'dē*, PAMFILIS: 1398-1470: in Italy, deemed the inventor of movable types, and in 1868 was honored by the erection of a monument at Feltre. In early life he applied himself to poetry with little success, and afterward established a school of fine arts at Feltre, which attracted many foreigners. It is claimed that in this way C. came into connection with Faust, and, as his friend, imparted to him the use of his invention.

CASTALIA, *kās-tā'li-a*: fountain on the slope of Parnassus a little above Delphi, in Phocis, sacred to Apollo and the muses. It was the 'holy water' of the Delphian temple; and all who came to consult the oracle, or visited the place with any religious purpose whatever, were wont to bathe their hair *rore puro Castaliæ* (in the pure dew of C.), but those who wished to be purified from murder bathed their whole body. The Roman poets feigned that its waters filled the mind of those who drank of it with poetic inspiration. It was imagined to have some connection with the river Cephissus, and to flow from the subterranean Styx. The fountain, whose waters are still pure and delightful as in the days of classical antiquity, now bears the name of St. John, from a small chapel of that name close by. CASTALIAN, a. *kās-tā'li-ān* [L. *Castalius*]: pertaining to Castalia.

CASTALIO: see CASTELLIO.

CASTANEA: see CHESTNUT.

CASTANETS, n. plu. *kās'tā-něts'* [Sp. *castanyeta*, castanets—from *castanya*, a chestnut]: musical instrument of percussion in the form of two small hollow concave shells (now usually made of ivory or hard wood), shaped like spoons, which are bound together by a band fastened on the thumb, and struck by the fingers to produce a thrilling sound during a dance in keeping with the rhythm of the music. The *krotalon* of the ancients was somewhat similar. The C. were introduced into Spain by the Moors, where they retain the name of castanulas, from their resemblance to the form of the chestnut. The C. are much used in ballet and opera.

CASTAÑOS, *kās-tān'yōs*, Don FRANCISCO XAVIER DE, Duke of Baylen: 1756-1852, Sep. 24; b. Madrid: Spanish general. He studied in Germany the military tactics of Frederick the Great. For some time after his return to Spain he had no opportunity of acquiring distinction; but when Napoleon I. invaded that country, C. received the command of a division of the Spanish army, and 1808, July 22, compelled 20,000 French, under General Dupont, to surrender at Baylen. It is asserted, however, that the merit of this prodigious success belonged more to Aloys Reding, a Swiss by birth, and the second in command. In Nov. of the same year C. was in turn defeated by the French at Tudela. The arrival of Wellington necessarily reduced him to a subordinate position, but he took part in the important battles of Albuera, Salamanca, and Vittoria.

CASTANOSPERMUM—CAST.

In 1811, he was appointed gen. of the 4th Spanish *corps d'armée*, and commandant of several provinces. In 1815, he was placed at the head of 80,000 troops, destined to invade France, some of which had already crossed the frontier when the news came of the battle of Waterloo. Although no great favorite with the court politicians, his ability could not be overlooked. In 1825, he was called to the state council, where he became a decided opponent of the Carlist party. He died at the age of 96.

CASTANOSPERMUM, *kās-tā-nō-spér'mūm* [Gr. *kastanōn*, a chestnut; *sperma*, a seed]: genus of plants, named from the fancied resemblance of the seeds to the edible chestnuts of Europe. It comprises only one species, and belongs to the papilionaceous section of leguminous plants. It is found at Moreton Bay, in Queensland, Australia, where it grows to a height of from 40 to 50 ft. The pea-like flowers are produced in racemes, and are of a bright yellow color. The fruit is a pendulous cylindrical pod, six or eight inches in length, and tapering to both ends. It generally contains four seeds, rather larger than chestnuts, which are roasted and eaten, but are far inferior to the European chestnut, and have an astringent taste.

CASTAWAY, n. *kāst'ă-wā* [*cast*, and *away*]: a person lost or abandoned: ADJ. shipwrecked; useless; of no value.

CAST—CASTING-LINE: in *angling*, a gut-line on which the artificial flies are fastened; made of several lengths of gut, knotted together, usually two to four yards long. The flies are attached at intervals of about two feet, and the line with its flies is called a *cast*. The term *cast* is also applied to a part of a stream where certain fish may be taken, as a *trout-cast*, a *salmon-cast*. See CASTING.

CASTE.

CASTE, *n.* *kāst* [Port. *casta*, breed, race—from *casta*, as an adj., chaste, pure, in allusion to purity of breed—from L. *castus*, chaste]: a name applied to a section of the numerous classes into which the Hindoos are divided; a class or circle of persons in any community who chiefly hold intercourse within their own limits. CASTE-PREJUDICE, an exclusive feeling against social intercourse with those not of a similar rank or class.

CASTE, *kāst*: term applied chiefly to distinct classes or sections of society in India; in a modified sense, to social distinctions of an exclusive nature among the nations of the West. When, at the end of the 15th c., the Portuguese began to penetrate to India by the Cape of Good Hope, and to trade with the Deccan, or s. portion of the Indian peninsula, they found arbitrary social laws, full of intricate regulations which constantly interfered with their intercourse with the natives, especially in matters involving the *subdivision of labor*. They found certain pursuits invariably followed by a certain class, and any attempt to induce a man to perform offices not appointed for the class of which he was a member met with violent opposition, though such offices might, according to European notions, be more honorable than many he was content to fulfil. They observed, also, that these different classes often varied in appearance, the result, in some cases, of their addiction for many generations to the same pursuits; in others, of their having actually arisen from a different stock. Hence they applied to these various divisions of society the term *casta*—a Portuguese and Spanish word, meaning a breed. As applied to these classes of Hindu society, the word has passed into most European languages. From its frequent use in India, it has sometimes been erroneously considered of Hindu origin. In Sanskrit, castes are called *Varnas*, i.e., ‘colors;’ color being, no doubt, the chief distinction at first. Of late it has been spelled *caste*, but by old authors *cast*; and it is even a question whether the word may not be as genuine English, as *casta* is Spanish.

In the s. of India the Portuguese became acquainted with what is considered the most exaggerated evil of caste. There are found there large numbers of a class called *Pariahs*, or, in other districts of India, *Chandalas*. They are probably the relics of some early-conquered race, who have been degraded by uninterrupted ages of oppression, as is represented to have been the case with the Helots of Sparta, and peoples in a similar condition. These Pariahs were always identified with outcasts—i.e., persons who had forfeited the privileges of their original order. No one of any C. would have any communication with them. If one of them even touched a Nayar, or warrior of high C., he might with impunity kill him. Some sorts of food were defiled by even their shadow passing over them; and the name of Pariah or Chandal conveyed to the Hindu the idea of the utmost vileness and disgust. All who violated the institutions of their class were held to sink out of all caste into this class—a condition which involved the loss of all respectability and comfort. These regulations were, moreover, referred to religion.

As India was at this time the land of the marvellous, and

CASTE.

its inhabitants, though as various as the different nations of Europe, were viewed by Europeans as one homogenous people, what was true of only one portion of the peninsula, was considered as prevailing everywhere, and as identical with the divisions of the Indians into *seven* tribes or castes, mentioned in olden times by Strabo, by Diodorus Siculus, and by Arrian. Nor was it forgotten that the Egyptians, whose early civilization was as undoubted as that of India, were also divided, according to Herodotus, into seven classes—priests, warriors, herdsmen, swineherds, tradesmen, interpreters, and pilots, to each of which were assigned particular districts.

About the middle of the 16th c., however, Abraham Roger, chaplain of the Dutch factory at Pulicat, gained the confidence of a Brahman acquainted with the Sanskrit language, and by this means learned almost exactly the account of the origin of C. given in the *Laws of Menu*, a work inferred to have been written not later than B.C. 900, long known only by name in Europe, until about the end of the last c., when a copy was obtained and translated by Sir William Jones. The whole of the Hindus are represented by Menu as divided into four classes :

1. The *Brahmans* or *sacerdotal class*, who are said, at the moment of creation, to have issued from the *mouth* of Brahma. Their business is reading and teaching the Vedas, and the performance of sacrifice for themselves and others. They are to be the chief of all created beings ; the rest of mortals enjoy life through them. By their imprecations, they can destroy kings, with all their troops, and elephants, and poms. Indra, when cursed by one of them, was hurled from his own heaven, and compelled to animate a cat. Hence, the Brahman is to be treated with the most profound respect, even by kings. His life and person are protected by the severest laws for this world, and the most tremendous denunciations for the next. His own offenses are treated with singular lenity ; all offenses against him with terrible severity. He is forbidden to live by service, but on alms ; and it is incumbent upon virtuous men and kings to support him with liberality ; and all ceremonies of religion involve feasts and presents to him. The first part of his life is to be devoted to an unremitting study of the Vedas—books, be it observed, older than the code of Menu, and yet, except, perhaps, one of the later hymns, containing no mention of C. as a religious ordinance. He is to perform servile offices for his preceptor, and beg from door to door. In the second quarter, he lives with his wife, reads and teaches the Vedas, assists at sacrifices, and, ‘clean and decent, his hair and beard clipped, his passions subdued, his mantle white, his body pure, with a staff and a copy of the Vedas in his hand, and bright golden rings in his ears,’ he leads a studious and decorous life. The third quarter of his life he must spend in the woods, as an anchorite, clad in bark without fire, wholly silent, and feeding on roots and fruits. The last period he is released from external forms and mortifications, and is to spend his time meditating

on the divinity, until at length he quits the body, 'as a bird leaves the branch of a tree, at pleasure.'

2. The *Kshatrya*, or *Chuttree*, or *military class*, sprang from the *arm* of Brahma, and bear something of a sacred character. It is stated that the sacerdotal order cannot prosper without the military, or the military without the sacerdotal; and the prosperity of both, as well in this world as in the next, is made to depend on their cordial union. The *Kshatrya* are to give alms, to sacrifice, to read the Vedas, and defend the people. Though Brahmans are to draw up and interpret laws, they are carefully excluded from administering them. The *executive* government is vested in the *Kshatryas* alone.

3. The *Vaisya*, or *Bais*, or *mercantile class*, sprang from the *thigh* of Brahma. Their grand duties are to keep cattle, carry on trade, lend on interest, cultivate the soil, and turn their attention to every description of practical knowledge. They are to be perfect men of business.

4. The *Sudras*, or *Sooders*, or *servile class*, came from the *foot* of Brahma. They are to serve the three superior classes, more especially the Brahmans. Their condition is never to be improved; they are not to accumulate property, and are unable by any means to approach the dignity of the higher classes. Utter and entire submissiveness to the Brahmans is the spirit of all a Sudra's duties, and this is to be enforced by penalties as severe as they are ridiculous. Yet, withal, the Sudras were not to be slaves, either public or private, and to occupy a position much higher than the Chandalas.

Mixture of castes, though not absolutely forbidden, entails disadvantages on the children, and the offspring of a Brahmanical woman and a Sudra becomes a Chandala, or outcast.

Such—omitting the minute and childish laws and penalties, many hundreds in number, by which it is proposed to carry the principle of C. into the pettiest affairs of life—is a brief outline of C., as gathered from the code of Menu. There is no historical evidence that it ever existed in this form, and, from the nature of the case we may conclude that it never did. In the *Toy-cart*, the oldest Hindu drama, no extravagant veneration for Brahmans anywhere appears. In fact, one of them is condemned to death; and the arrangements of society appear to have been the same as at present. The laws of C. form, it is true, a part of what is reputed to be Hindu law, but they have remained in all the states of India, Hindu as well as Mohammedan, to a great extent a dead-letter. There is nothing to show that the code of Menu was drawn up for the regulation of any particular state. Some have even conjectured that it may have been the work of some learned man, designed to set forth his idea of a perfect commonwealth under Hindu institutions, just as Plato in *The Republic* sets forth his idea of a model government under Greek institutions.

Be this as it may, the C. which at present exists throughout the greater part of India is very different from that

described in the code of Menu, though to that it owes, no doubt, much of its stability and its importance in the eyes of Europeans. With the exception of the Brahmans, the pure castes have disappeared, and out of the intermixture of the others have sprung innumerable classes, many of them unauthorized except by the people themselves. So ingrained in the whole community is this tendency to class distinctions that Mussulmans, Jews, Parsees, and Christians fall, in some degree, into it; and even excommunicated or outcast Pariahs form castes among themselves. Most of the existing castes partake of the nature of associations for mutual support or familiar intercourse, and are dependent upon a man's trade, occupation, or profession. Many of them have been described by Mr. Colebrooke in the *Asiatic Transactions*, vol. v. Many have had their origin in guilds, in schism from other castes, in the possession of a particular sort of property (as, for instance, landlords are spoken of as the C. of *zemindars*), and similar accidental circumstances. Their names are often due to the district in which the C. took its rise, to their founder, to their peculiar creed, or any random circumstance. In the Bengal presidency, there are many hundreds of such castes, almost every district containing some unknown in those adjacent. Among the lowest classes, and especially among the servants of the English at Calcutta, it has degenerated into a fastidious tenacity of the rights and privileges of station. For example, the man who sweeps your room will not take an empty cup from your hand; your groom will not mow a little grass; a coolie will carry any load, however offensive, upon his head, but, even in a matter of life and death, would refuse to carry a man, for that is the business of another caste. Such and many other regulations are described in every work on C., but, however annoying, are as unworthy of serious regard as are the assertions of self-importance found among little people all the world over. When a European or American servant pleads that such a work 'is not his place,' his excuse is analogous to that of the Hindu servant when he pleads his caste. When an Englishman of birth or profession, which is held to confer gentility, refuses to associate with a tradesman or mechanic—or when members of an association or order hold themselves largely aloof from others—or when any similar social distinction is established or urged, it would present itself to the mind of the Hindu as a regulation of caste.

Nor does C., at the present day, *tie a man down to follow his father's business*, except, perhaps, in the case of the more sacred functions of the Brahmans. For the rest, Brahmans serve as soldiers, and even as cooks. Men of all castes have risen to power, just as in England our statesmen have sprung from every class of society. Nor again, is loss of C. anything so terrible as has been represented; in most cases, it may be recovered by a frugal repast given to the members of the C.; or the outcast joins another C., among whom he will commonly be received with the

heartiness due to a new convert. In the East, C. enters into all the most ordinary relations of life. In the West, however, Christianity has ever tended gradually to ameliorate social differences, while the unpractical and unaroused mind of the Hindu has had a contrary effect.

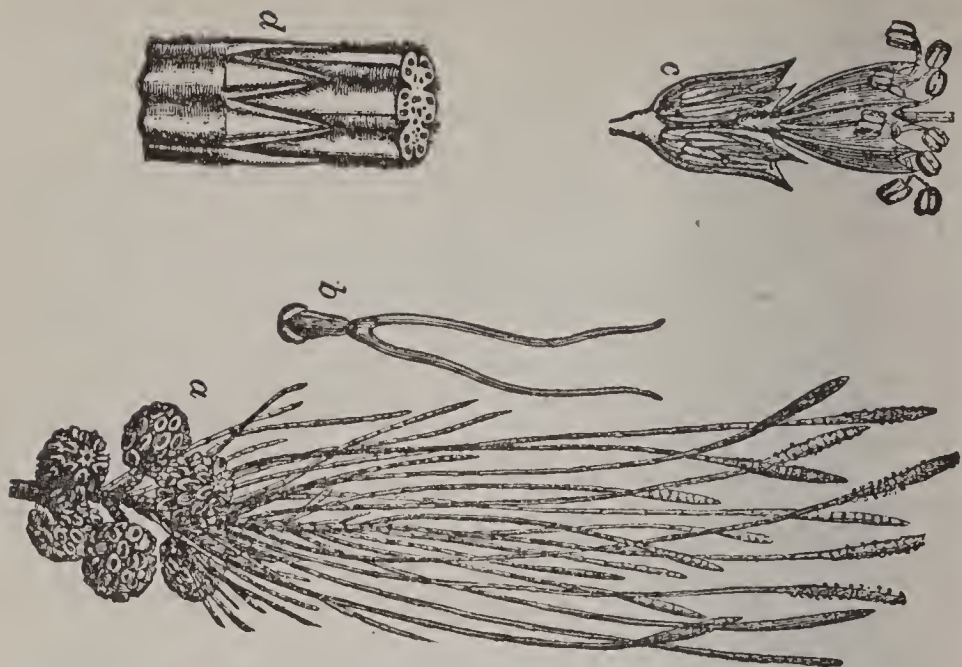
These modified views of C., which have begun to prevail in recent years, will be found more fully developed in Shore *On Indian Affairs*, Irving's *Theory and Practice of Caste*. Full accounts of the petty regulations of C., as laid down in the code of Menu, may be seen in Sir William Jones's *Translation of the Code of Menu*, Robertson's *Disquisition on India*, Richard's *India*, Elphinstone's *History of India*, Dubois's *India*, Colebrooke's *Asiatic Transactions*, vol. v., and in various articles in the *Calcutta Review*. See above all the first vol. of Dr. John Muir's *Original Sanscrit Texts on the Origin and Progress of the Religion and Institutions of India*; collected, translated by Notes (5 vols.); and admirable illustrations of the system given in Sherring's *Hindu Tribes and Castes as represented in Benares* (3 vols., 1872-81).

CASTEGGIO, *kás-téd'jo*, or MONTEBELLO: town of Piedmont, n. Italy, 5 m. e.n.e. of Voghera. In the campaign of 1859, C. was occupied by Austrians prior to the battle of Montebello, in which they were defeated by the French and Sardinians. C. was also valorously but unsuccessfully defended by the Austrians in the great battle of Montebello between them and the army of Napoleon I. 1800. As *Clastidium*, C. was an important military position as early as the times of the Gallic and Punic wars. Some Roman antiquities still remain, and numerous curious inscriptions and coins have been found. Pop. 3,200.

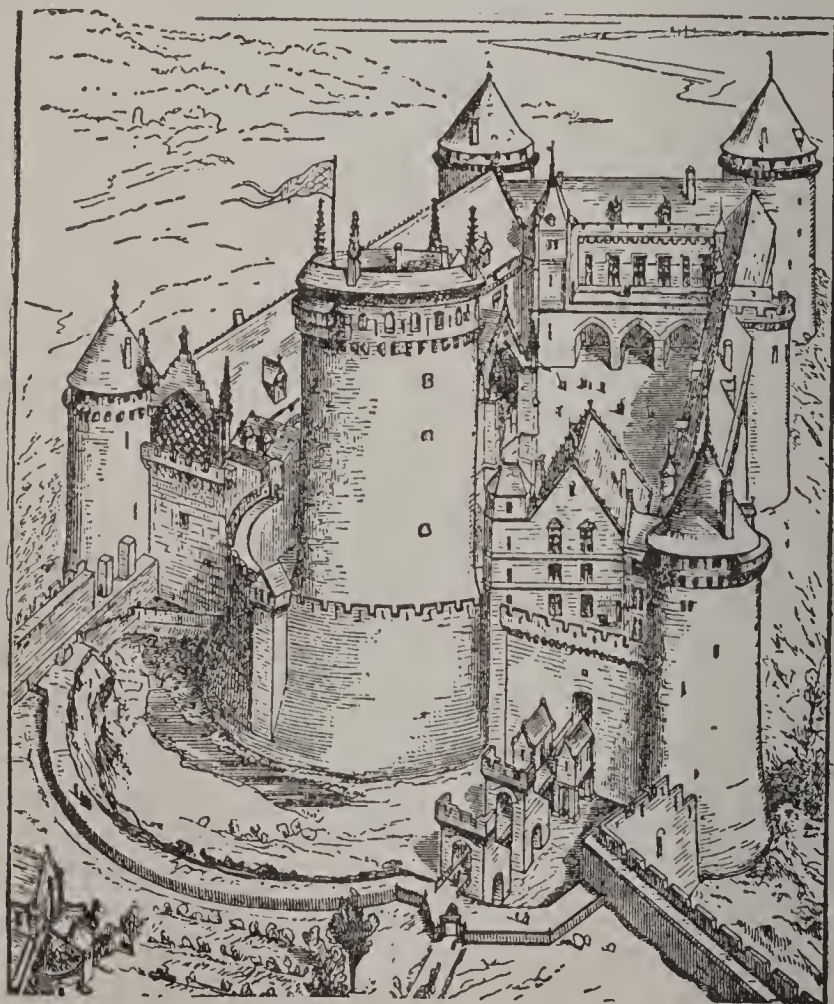
CASTEL, *kás-tél'* (from Latin *castellum*, see CASTLE): name prefixed to various places in Italy, France, Spain, Portugal, etc.

CASTEL-ARQUATO, *-ar-kwá'to*: town of Parma n. Italy, 19 m. s.e. of Piacenza, picturesquely situated amid forests and vineyards, with a fine Gothic church and a noble old castle, from which the town derives its name. It has manufactures of silk. Pop. 4,400.

CASTELAR Y RISSOLL, *kás-tā-lár' ē rīs-sol'*, EMILIO: Spanish republican: b. Cadiz, 1832, Sep. 8. He received a limited education at home; subsequently studied in Madrid; early became known for his liberal, democratic, and socialist opinions; first distinguished himself as an orator in the revolution 1854; was appointed prof. of history in the Univ. of Madrid 1857; founded a democratic newspaper 1864; was condemned to death after the revolution 1866, but escaped to France; was active in the revolution 1868; and became a member of the cortes and leader of the republican party. After the abdication of King Amadeus, he became minister of foreign affairs 1873, Feb. 12; was elected pres. of the cortes Aug. 24; and was pres. of the republic from 1873, Sep. 6, till 1874, Jan. 2. He is noted as an orator, and a writer on historical, literary, and political subjects.



Branch of *Casuarina equisetifolia*: with male and female flowers, the former in catkins at the end of the shoots, the latter (*a*) crowded in cone-like heads. At *b*, note single female flower, and at *c*, a group of male flowers. A section of the fluted stem, with reduced leaves, is represented at *d*.



Castle of Couci.

CASTEL-BOLOGNESE—CASTELLAMARE.

CASTEL-BOLOGNESE, *-bo-lōn-yā'sā*: town of n. Italy, about 22 m. w.s.w. from Ravenna. It derives its name from a strong fortress built here by the Bolognese in the 14th c.; and is historically famous as the scene of a decisive battle between the Milanese and Florentines 1434, in which the latter were completely vanquished.

CASTEL-BUONO, *-bō-ō'no*: town of Sicily, province of Palermo, eight m. s.e. of Cefalù; noted for its mineral springs. It has a trade in manna. Pop. 8,439.

CASTEL-FRANCO, *-frān'kō*: town of central Italy, eight m. e. of Modena, with the old walls and ramparts of a castle built by Urban VIII., and near the site of the battle between the consuls Hirtius and Pansa and Mark Antony.

CASTEL-FRANCO: town of Italy, in the govt. of Venice, about 25 m. n.w. from the city of Venice; with linen and woolen manufactures. Pop. 4,220.

CASTEL-GANDOLFO, *-gān-dol'fo*: village of the former Papal States, 11 m. s.e. of Rome, near the w. shore of Lake Albano. Its situation is extremely picturesque, and it commands extensive views of some of the most beautiful scenery in Italy. The pope has his summer residence here. In early times, the noble family of the Savelli had a stronghold at C., by means of which, for a period of nearly 400 years, they bade defiance to popes, barons, and *bourgeoisie*. Pop. 1,144.

CASTELLAMARE, *kās-tēl'ā-mā'rā*: fortified city and seaport of s. Italy, about 17 m. s.e. of the city of Naples. It is built on the lower slopes of Monte d'Auro, and along a sheltered beach on the s.e. side of the Gulf of Naples, over which it commands a magnificent view. It is on or near the site of the ancient *Stabiæ*, which was desolated by Sylla during the social war, and where the elder Pliny afterward lost his life when the city was overwhelmed with lava from Vesuvius. Some ancient remains have been found here. The town was sacked in the 15th c., by Pope Pius II., and again in the 17th c. by the Duc de Guise. It has a royal palace, a cathedral, several convents, among which that founded by Gonsalvo de Cordova, in the 16th c., is famous for the possession of an image of the Madonna (found in a well in the 11th c.), which is greatly venerated by the peasantry, who make an annual pilgrimage to the church. The old castle, which gave name to the town, was built in the 12 c. C. has a royal dockyard, affording employment to many of the inhabitants, and manufactures of linen, silk, cotton, leather, and sail-cloth. Pop. (1881) 22,207; (1891) 33,102.

CASTELLAMARE: town in Sicily, at the head of a gulf of the same name; 20 m. e. from Trapani. It exports cotton, wine, fruit, and manna. Pop. 11,280.

CASTELLAMARE, GULF OF: an extensive bay on the n. coast of Sicily. Its width from e. to w., between Point Uomo Morto and Cape St. Vito, is about 15 m.; and its depth about 14 m. It has deep water and good anchorage, but is much exposed to n. winds,

CASTELLAMONTÉ—CASTELLO.

CASTELLAMONTÉ, *kās-těl'lá-mōn'tā*: town of n. Italy, province of Turin, 10 m. s.w. of Ivrea. It has an old castle, manufactures of earthenware, and a trade in the agricultural produce of the district. Pop. 2,500.

CASTELLAN, n. *kās'těl-àn* [Sp. *castellano*, the warden of a castle], the governor or warden of a castle or *burg*; called also *Châtelain*. The office and the rank of the C. were various in various countries. In France and Flanders, the titles C. belonged to the holders of certain demesnes, and was next in order of rank to that of a bailiff. In Germany, the C. had the jurisdiction of a burg-graf during the ages of chivalry. In Poland, the title of C., with its appendages, remained in later times, and, after the 16th c., the castellans, with the waiwodes and bishops, formed the senate or superior legislative chamber. **CASTELLANY**, n. *kās'těl-lń-ŷ*, the lordship of a castle with its land and jurisdiction.

CASTELLANA, *kās-těl-lá'ná*: town of s. Italy, province of Bari, 26 m. s.e. of the city of Bari. Its trade is confined to the produce of the district. Pop. 8,092.

CASTELLANETA, *kās-těl-lá-nā'tá*: town of s. Italy, province of Lecce, 20 m. n.w. of Taranto. It has a cathedral and several convents. Cotton is grown in the district. Pop. 7,913.

CASTELLATED: see under **CASTLE**.

CASTELLAZZO, *kās-těl-lát'sō*: town of n. Italy, about five m. s.w. of Alessandria. Pop. 5,500.

CASTELLEONÉ: town of Lombardy, n. Italy, near the Oglio, about 12 m. n.n.w. of Cremona. It is surrounded by old walls, and has a fine church. Pop. 4,000.

CASTELLIO, *kās-tāl-yo'*, or **CASTALIO**, *kās-tá-lyo'*, **SEBASTIANUS**: 1515–63; b. in Dauphiné: theologian. His proper name was *Châteillon*, which he Latinized, according to the usage of his time. About 1540, he was invited to Geneva by Calvin, and appointed humanity professor; but having the misfortune, afterward, to differ from the reformer in religious opinion, he was banished from the city, and went to Basel, where he spent the rest of his life in great poverty: see **CALVIN**.

Among his various writings are *De Hæreticis*, etc.—a treatise which argues against the right of the magistrate to punish heretical opinions, and which produced a reply from Beza; a Latin version of the Old and New Testaments, 1551, dedicated to Edward VI. of England; and a posthumous work, in dialogue, on predestination, election, free-will, and faith, first published by Faustus Socinus 1578,

CASTELLO, *kās-těl'lo*, **GIOVANNI BATTISTA**: 1500–69; b. Bergamo, Italy: painter. He decorated the Nunziata di Portoria in Genoa, the saloon of the Lanzi palace at Gorlago, and the Pardo palace in Spain. His best known pictures are the *Martyrdom of St. Sebastian* and the *Judge of the World* in the Nunziata at Genoa. He was also sculptor and architect, and in the last capacity was invited, 1567, by Philip II. to Madrid, and died there.

CASTELLO—CASTELNAU.

CASTELLO, VALERIO: 1625-59; youngest son of Bernardo C. (1557-1629), a Genoese painter, whom Valerio surpassed. He was best in battle scenes, which were supposed to combine the fire of Tintoretto with the style of Paul Veronese. His *Rape of the Sabines*, in the Brignoli palace at Genoa, was painted on the same day in which he decorated the church of the Annunciation.

CASTELLON, kás-těl-yōn': province of Spain, part of the ancient kingdom of Valencia, bounded on the n. by Tarragona, e. by the Mediterranean, s. by Valencia, and w. by Teruel, 2,447 sq. m. It is mountainous, watered by the Mijares, Palencia, and other small streams, and has many mines and mineral springs. The cultivated parts produce grain. Chief towns, C. de la Plana, Benicardo, Villareal, and Burriana. Pop. abt. (1887) 292,437.

CASTELLON DE LA PLANA, kás-těl-yōn' dā láplá'ná: town of Spain, cap. of the province of the same name: in the midst of a fruitful plain, about 4 m. from the Mediterranean, 40 m. n.n.e. of Valencia. A magnificent aqueduct supplies irrigation. C. is surrounded by walls, and is for the most part well built. It has some handsome old churches, and a singular bell-tower 260 ft. high. Ribalta, celebrated Spanish painter, was a native of Castellon de la Plana. It has manufactures of linen, woolen, sail-cloth, paper, earthenware, and firearms; also brandy distilleries, and an active trade. Pop. 23,000.

CASTELNAU, kás-těl-nō', MICHEL DE, Sieur DE LA MAUVISSIERE: about 1520-92; b. Touraine. French soldier and diplomatist: his grandfather was equerry to Louis XII. He was well educated, travelled in Italy, and visited Malta. Entering the army he served in the Italian campaigns, was patronized and employed by the cardinal of Lorraine, received a naval command 1557, declined knighthood, and rejoined the French army in Picardy. The Constable de Montmorency intrusted him with several delicate missions, in which he won such credit that Henry II. sent him to Scotland with despatches for Mary Stuart, then betrothed to the dauphin, to England to treat with Elizabeth concerning her claim to Calais, and to Germany to estrange the princes from the Protestant cause. After this he went on missions to Margaret of Parma in the Netherlands, to Savoy, and to Rome, where he promoted the election of Pius IV. He re-entered the French navy, and at Nantes detected and reported the first signs of the conspiracy of Amboise. Francis II. having died 1560, C. attended Queen Mary to Scotland and spent a year there, giving her much good advice and endeavoring to remove the ill-will between her and Elizabeth, whom he several times visited in this interest. Returning to France, 1562, he was sent against the Protestants in Brittany, and made prisoner, but soon exchanged. Throughout the religious troubles he counselled the govt. to moderation. He served at the siege of Rouen and the battle of Dreux, took Tancarville, and helped retake Havre from the English 1563. Other missions followed—to Elizabeth to negotiate

CASTELNAUDARY—CASTEL-TERMINI.

a peace, to Alva in the Netherlands, and to Germany to secure aid against the Protestants. He discovered the plot of Condé and Coligny to carry off the royal family, 1567; was made gov. of St. Dizier and capt. of a company, and bore part in the battles of Jarnac and Moncontour. To assuage the excitement caused by the massacre of St. Bartholomew, Charles IX. sent him, 1572, to England, to Germany, and to Switzerland. 1574-84 he was ambassador to Elizabeth, and endeavored to bring about her marriage to the Duke of Alençon, but learned to distrust her promises. Returning to France, he would not bow to the League and was deprived of his governorship by the Duke of Guise; this and the destruction of his chateau in the civil wars brought him to poverty. On Henry IV.'s accession, C. received a command in the army, and was sent on several missions. He died at Joinville. His *Mémoires*, written in England for his son, cover the years 1559-70, and are clear, vivacious, and impartial. They were first printed 1621; enlarged to 2 vols. folio; 1659; again enlarged to 3 vols. folio, 1731. C. translated Ramus's Latin book on the *Manners and Customs of the Ancient Gauls*. Some of his letters are preserved in the Cottonian and Harleian collections in the British Museum.

CASTELNAUDARY, *kās-těł-nō-dā-rě'*: town in the dept. of Aude, France; on a declivity, skirted at the base by the Canal du Midi, 22 m. from Carcassone. It has manufactures of woolen and silk fabrics, and earthenware, and a lively trade in agricultural produce. The canal at this point expands into a large basin, which serves as a haven. C. suffered dreadfully in the crusade against the Albigenses, and was, in 1212, the scene of a battle between Simon de Montfort and Raymond, Count of Toulouse. In 1355, it was captured by the Black Prince. In 1632, Marshal Schomberg here gained a victory over the party of the Duke of Orleans, when the brave Duke of Montmorency was taken prisoner, and afterward put to death at Toulouse. Pop. (1886) 8,641; (1891) 10,059.

CASTELNUOVO, *kās-těł-nō-ō'vō*: seaport town of Dalmatia, Austria; near the w. entrance of the Gulf of Cattaro: surrounded by walls, and defended by two forts and a citadel. It has manufactures of brass and a trade in the produce of the district, which is fertile. It was captured by the British 1814. Pop., (1897) about 10,000.

CASTEL-SARDO, *-sār'dō* (formerly *C. Aragonesa*): fortified town and seaport, the strongest on the island of Sardinia; on a steep rock on the n. coast, 16 m. n.e. of Sassari. The environs produce wine. Pop. 1,946.

CASTEL-SARRASIN, *-sar-râ-săng'*: town of France, dept. of Tarn et Garonne; on the Songaine, 12 m. w. from Montauban. It has the remains of an old castle said to be of Saracenic origin; manufactures of serge and worsted stockings, and a trade in the agricultural produce of the district. Pop. abt. 4,000

CASTEL-TERMINI, *-těr'mē-nē* (anc. *Camicianæ Aquæ*): town of Sicily, province of Girgenti, 16 m. n. from the

CASTEL-VETRANO—CASTIGLIONE.

city of Girgenti. It has extensive mines of rock-salt and sulphur. Pop. 8,200.

CASTEL-VETRANO, -*vā-trā'no*: town of Sicily, province of Trapani, 20 m. s.e. of the town of Trapani. It is an interesting place with an old castle, several convents, and manufactures of articles of coral and alabaster. Some of the most esteemed white wine of Sicily is produced in the vicinity. Pop. (1881) 20,053; (1891) 20,420.

CASTER, n. *kās'tēr* [see CAST]: one who casts; a small spice bottle or cruet. CAS'TERS, n. plu. small wheels attached to the legs of sofas, tables, etc.; sometimes written CAS'TORS.

CASTIGATE, v. *kās'tī-gāt* [L. *castigātus*, kept chaste, corrected, chastized—from *castus*, chaste, pure: It. *castigare*]. to correct or chastise; to criticize severely in writing; to punish with stripes. CAS'TIGATING, imp. CAS'TIGATED, pp. CAS'TIGA'TION, n. -*gā'shūn*, correction or punishment administered by writings or words; a whipping. CAS'TIGATOR, n. -*tēr*, one who. CAS'TIGA'TORY, a. -*ter-ī*, corrective: N. the thing used in correction.—SYN. of 'castigation': punishment; correction; chastisement; discipline.

CASTIGLIONE, *kās-tēl-yō'nā*: town of Sicily, province of Catania; on the n. slope of Mount Etna, on the right bank of the Cantara, 35 m. s.w. of Messina. The town stands on a square-rock rising abruptly from the valley, and having a double crest, on which stand a domed church and the ruins of a feudal castle. Here, in 1297, in the war of the vespers, Admiral Roger Toria raised the standard of rebellion against his sovereign, Frederick of Aragon. In the district are several large nut-plantations, which produce the best Sicilian hazel-nuts. Pop. 8,000.

CASTIGLIONE, *kās-tēl-yō'nā*: village of Italy, 10 m. e. of Rome, on the site of Gabii. A temple of Juno, a Greek theatre, and an aqueduct are prominent among its ancient ruins.

CASTIGLIO'NÉ: village of Italy, on the Stiviere, and near the Lago di Garda, 16 m. s.e. of Brescia. Here the Austrian vanguard under Wurmser was defeated 1796, Aug. 3, by the French under Augereau, and the main army two days later by Bonaparte. The battle of Solferino, 1859, June 24, had nearly the same field.

CASTIGLIONE, *kās-tēl-yō'nā*, BALDASARRE', Count: 1478–1529; b. Casatico, in the duchy of Mantua: one of the most elegant of the old Italian writers. He studied at Milan. His shining talents, knowledge, and pleasing manners made him a favorite of Guidobaldo di Montefeltro, Duke of Urbino, a great patron of literature, at whose court he was honorably entertained, with other men of eminence in letters. He was employed by the duke as envoy to Henry VIII. of England, who made him a knight, and was afterward sent in the same capacity to Louis XII. of France, under Guidobaldo's successor, in several important ambassadorial missions. He died at Toledo. His chief work is the book *Del Cortgeiano*, a manual for courtiers, remarkable for

its elegant style. His Italian and Latin poems are also models of elegance, and his *Letters* (2 vols., Padua, 1769–71) contains interesting contributions to the political and literary history of his time. Tasso devoted a sonnet to the death of C. and Giulio Romano raised to his memory a monument in Padua.

CASTIGLIO'NE, CARLO OTTAVIO, COUNT: 1795–1849, Apr. 10; b. Milan: philologist. He early showed a predilection for antiquarian studies, particularly numismatics. When only 24 years of age he published a description of the Kufic coins in the cabinet of Brera, Milan, under the title, *Monete Cufiche del Museo di Milano* (Milan, 1819). C.'s principal work in oriental literature is *Mémoire géographique et numismatique sur la Partie orientale de la Barbarie appelée Afrikiah par les Arabes, suivi de Recherches sur les Berbères Atlantiques* (Milan, 1826), in which he seeks to ascertain the origin and the history of the towns in Barbary whose names are found on Arabic coins. Out of Italy C. is best known by his edition of some fragments of the Mæso-Gothic translation of the Bible by Ulphilas (q. v.), which had been discovered, 1817, by Cardinal Mai among the palimpsests of the Ambrosian library. At first he published some specimens in conjunction with Mai, but in 1829, '34, '35, and '39 appeared a variety of fragments of the Pauline epistles, edited by himself, and enriched with valuable disquisitions, commentaries, and glossaries. He died at Genoa.

CASTIGLIO'NÉ, GIOVANNI BENEDETTO: 1616–70; b. Genoa: painter: called Il Grechetto. He studied under Vandyck, and painted portraits, landscapes, and historical pieces, but was best in fairs, markets, and animals. His works are found chiefly in Genoa and Mantua, but also in Rome, Venice, Florence, and Naples; eight are at the Louvre. *The Nativity*, in the church of San Luca at Genoa, is among his best. His etchings, full of spirit and remarkable for light and shade, earned him the name of a second Rembrandt: *Diogenes Seeking a Man* is an example of them. C.'s later years were spent in painting for the court at Mantua, where he died. Many pictures ascribed to him may be copies, or by his brother Salvatore or his son Francesco.

CASTIGLIONE, *kās-tēl-yō'nā*, LAKE OF: lagoon of central Italy, province of Siena. It lies north of Grosseto; length about 10 m., breadth one to three miles. Receiving the waters of the Bruna and other rivers, it discharges its water by a short canal into the Mediterranean.

CASTIGLIONE DELLE STIVIERE, *kās tēl-yō'nā dēl'-lā stē-vē-ā'rā*: town of n. Italy, 22 m. n.w. of Mantua. It is walled and defended by an ancient castle; but is noted chiefly for the victory obtained here by the French over the Austrians 1796, which gave the title of Duc de Castiglione to Marshal Augereau. Pop., 4,000.

CASTILE, *kās-tēl'* (Spanish, CASTILLA, *kās-tēl'yá*): in a geographical and political point of view, the central district of the Spanish peninsula, being the middle and most strongly-marked plateau of Spain, as well as the central seat of the monarchy. Both geographically and po.

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litically it is divided into Old and New Castile—*Castilla la Vieja* and *Castilla la Nueva*. The former district, in $40^{\circ} 5' - 43^{\circ} 32'$ n. lat., and $1^{\circ} 40' - 5^{\circ} 35'$ w. long., rises, in the form of an elevated plateau, to the height of 2,500–3,000 ft. It is walled in on all sides: on the n., by the highest masses of the Cantabrian Mountains, which separate it from the Basque provinces and Asturias; on the s., by the high ridge forming the water-shed between the Douro and the Tagus; while the Sierras de Oca, de Urbion, and Moncayo, and the heights of Leon and Tras-os-Montes bound it on the e. and w. The high plateau of Old C. is scantily watered, and its natural characteristics far from inviting. In many parts, nothing is presented to the eye but a wide, unwooded, almost treeless waste of land, unrefreshed by streams, in some parts monotonously covered with stunted grasses, and in others, almost destitute of vegetation. The traveller may walk many miles without finding a village, or even a solitary farmhouse. All Old C., however, is not a dusty desert. There are rich tracts in it producing some of the finest wheat in the world. Madder and grasses also are produced abundantly in some parts; and even the olive flourishes where it is protected from the frost and snow of winter, and from the cold winds in Oct. and the following months. Iron and other minerals exist in plenty, but are not worked to any great extent. Sheep, cattle, pigs, and mules form the chief wealth of the inhabitants. Manufactures consist of coarse woolens, cotton, linen, leather, and glass.

The plateau of NEW CASTILE—between lat. $38^{\circ} 23'$ and $41^{\circ} 15'$ n., and long. 1° and $5^{\circ} 25'$ w.—like Old C., is inclosed by mountains. Though lying 1,800 ft. lower than Old C., New C. presents many similar characteristics of soil and scenery. It is mostly sterile, and scantily irrigated; little rain falls, and the nightly dews are insufficient to refresh the plains, which are entirely destitute of trees, and, in summer, appear quite burned up. Olives, corn, pulse, and saffron, are cultivated in some neighborhoods; but flocks of sheep are the chief wealth of extensive tracts of land. The commerce, carried on by means of long trains of mules, reminds the tourist of the caravan-traffic over eastern deserts. Industry is restricted almost entirely to manufactures of coarse woollen goods. The yield of the salt-mines in the s. is considerable; and quicksilver, especially at Almaden (q.v.), and iron (manufactured at Toledo) are plentiful. The Castilians have even more than the general haughtiness of the Spanish character. Their language prevails throughout the educated classes, as in the literature of Spain, and their rulers have extended their sway over the whole nation.

C. became an independent country first in 762, and remained so till 1028, when it passed to Sancho III., King of Navarre. His son, Ferdinand I. (the Great), founded the kingdom of C., and among other acquisitions, annexed to it the kingdom of Leon. This union, however, was not permanent, Leon being made a separate kingdom for Ferdinand II. The two kingdoms, however, were reunited in the 13th c. in the person of Ferdinand III., and remained ever after under one sceptre. Among the succes-

CASTILE-SOAP—CASTINE.

sors of Ferdinand III., the most distinguished was Alfonso X., by whose direction the Alfonsine (astronomical) tables were drawn up. By the marriage of Isabella, sister and successor of Henry IV., with Ferdinand, King of Aragon (1469), the two crowns of C. and Aragon became united (1479), and from these sprang the kingdom of Spain, which, however, was not fully established before the death of Ferdinand, 1516, when Charles I. of Spain (Charles V. of Germany) inherited both crowns.

In the present administrative division of Spain into 49 provinces, the division of Old and New C., though it will long be remembered by the people, is one belonging to the past. Beside the 13 present provinces, the kingdom of Leon, Galicia, the principality of Asturias, and the district of Estremadura, Andalusia, Granada, and Murcia, belonged to the crown of Castile.

OLD CASTILE is now divided into the eight provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid; total 25,400 sq. m. Pop. (1887) 1,717,402.

NEW CASTILE includes the five provinces—Madrid, Guadalaxara, Cuença, Toledo, and Ciudad Real; total 20,200 sq. m. Pop. (1887) 1,780,003.

CASTILE-SOAP, *n.* *kās-tēl'* [from *Castile* in Spain]: a very pure variety of soap. CASTIL'IAN, *a.* *-tīl'ī-ān*, of or from Castile: *N.* a native.

CASTILLEJO, *kās-tēl-yā'cho*, CHRISTOVAL DE: 1494–1556: Spanish poet; b. Ciudad Rodrigo. He was sec. to Ferdinand of Austria, bro. of Charles V., afterward king of Hungary and Bohemia, and ultimately emperor of Germany. Though a priest, C. wrote in a strongly anti-clerical vein: the Inquisition suppressed large portions of his MS. satires, and filled the spaces with doggerel of its own rhymsters. C. had wit, grace, and charm, but was too voluminous and often trivial. He resisted the inroads of Garcilaso de la Vega and the new school, and confined himself to the old metrical forms, notable for ease and simplicity. His poems, in three books, treating respectively of love, conversation, and pastime, and moral and sacred themes, appeared 1573, 1598, 1600; best edition, Madrid, 1832.

CASTILLON, *kās-tē-yōng'*: town of France, dept. of Gironde; on the right bank of the Dordogne, 26 m. e. of Bordeaux. It has manufactures of cotton and woolen yarns, nails, and cordage. It was the scene of the battle between the forces of Henry VI. of England and Charles VII. of France, 1453, July, in which the English met with signal defeat, their leader, the Earl of Shrewsbury, and his son, being slain. Of all their possessions in France, Calais alone remained to the English after this battle, the incidents of which were seized on by Shakspeare for the sixth scene in his play of *King Henry VI., part I.* Pop. 3,000.

CASTINE, *kās-tēn'*: seaport town of Hancock co., Me., on the e. side of Penobscot Bay, at the mouth of the Penob-

CASTING—CASTING-NET.

scot river, 34 m. s. of Bangor and 9 m. e. of Belfast. It was settled 1667 by a French colony under the Baron de C.; abandoned in consequence of troubles with the Indians and English; resettled by the English 1760; taken by the British during the revolution, and again 1814. Its site is a peninsula inclosing a spacious harbor, capable of receiving vessels of the largest size. C. has some trade, and industries in boat-building and fishing. It contains a custom-house, a state normal school, and several churches. The pop. was almost stationary for 60 years: (1870) township, 1,303; (1880) village alone, 929; of late years it has attained some vogue as a summer resort. Pop. (1890) 987.

CASTING, in Angling: act of throwing a fly or a fish bait. See **CAST—CASTING LINE**. In casting a fly with a single-handed rod, the beginner should let out about as much line as the length of the rod; grasp the rod just above the reel; then wave it back over the right or left shoulder, with a slightly circular sweep, so as to extend the line behind; and then bring it forward with a steady cutting kind of action, urging the point of the rod toward the spot where the fly is to fall, taking care not to carry the point of the rod too far forward, or too low, or the line will not fall straight and evenly on the water. The object of the circular sweep behind is to prevent the fly from cracking off. By slightly raising the point of the rod just as the fly is delivered, the line is straightened; and the fly, checked in mid career, falls like thistle-down upon the water. Always allow time for the line to go straight out behind, for if returned too quickly, the fly cracks off. In casting with the double-handed rod, one hand grasps the rod above the reel, and the other below it, the lower hand acting as a pivot upon which the rod turns.

In casting a bait, either for spinning, trolling, or live-baiting, the bait is allowed to hang from the point of the rod about a yard. Taking the rod in both hands, the line clasped to the rod in his right, the angler waves the bait gently back; and having first drawn as much line as he requires off the reel, and laid it loosely at his feet, he sends the bait forward with a swing toward the point that he desires to reach.

CASTING-NET: species of net used in fishing. It has been found in use among various savage tribes in different parts of the world, some of whom, from constant practice, use it with a dexterity and address unknown in civilized countries. A usual size for nets is 13 to 20 ft. in circumference when spread out. They are netted in the shape of a long, loose bag or cone; and so much is the number of meshes increased as the net is being formed that it is capable of being spread out in a perfectly flat and circular form, the apex of the cone forming the centre of the circle. To this apex is attached a rope of some yards in length; when casting, this rope is fastened round the left wrist of the caster. The bottom of the net, which, when the net, held up by the apex, forms the base of the cone, or, when spread, the circumference of the circle, is hung around

with perforated leads or bullets. These not only sink the net to the bottom of the water, but, also, when it is cast, cause it to spread open. The bottom of the net is turned up six inches or more in depth, and hung up on the inside about every ten inches to an upper portion of the net, by stout strings, so as to form a kind of purse; this is called the 'tuck.' When the net is required to be cast, the caster, having fastened the rope to his wrist, and coiled it loosely in his left hand, hangs a portion of the net over his left shoulder; and then gathering as much of the outer edge of the net as he can collect in his right hand, and holding it up so as to open the net as much as possible, makes a semicircular sweep of the body and the right hand—rather difficult to accomplish without practice—and whirls the net away off the shoulder. The centrifugal motion thus communicated to the leads, etc., on the bottom of the net, causes it to open like a circle on the surface of the water, the leads carry it to the bottom, and the net thus covers all that comes within its circle. The rope is then pulled gradually, and worked from side to side, in order to narrow the circle, to bring it once more into a cone; and, in their efforts to escape, the fish that may have been covered are gradually driven into the tuck or purse of the net. When the leads are all close together, the net is lifted from the water, and the fish in the tuck are taken out. The cost of a C. N. is regulated by the circumference and the size of the mesh.

CASTING-VOTE: the deciding vote, which is usually a part of either the duty or the prerogative of the chairman or president of a meeting, by which he *casts* the balance on one side or the other, when the votes of the assembly are found equally divided. In the British house of commons, the speaker does not vote at all unless this occurrence takes place. As his position in this respect is felt to be delicate for a person whose duty it is to withdraw himself from the contentions of party, it is usual for the speaker to vote in such a way as to give the house an opportunity of reconsidering its decision. The same rule prevails in select committees. Following a similar rule, the chairman at corporation and general meetings usually gives his casting-vote either in a way that will lead to a reconsideration of the subject, or for what seems the popular view of the case, although that may be at variance with his convictions. In the U. S. senate the presiding officer has no vote when a majority vote has been given, but gives his casting-vote in case of an equal division.

CAST-IRON, or PIG-IRON: crudest form of iron: for the method of its production, see **IRON**. There are two leading kinds of it—namely, white pig-iron and gray pig-iron; the former is called also forge-iron, from being chiefly used for conversion into malleable iron and steel; and the latter is often called foundry-iron, from its suitability for castings. Of each of these, again, there are many varieties; and much light has of late years been thrown on what constitutes their different qualities, by experiments in the manu-

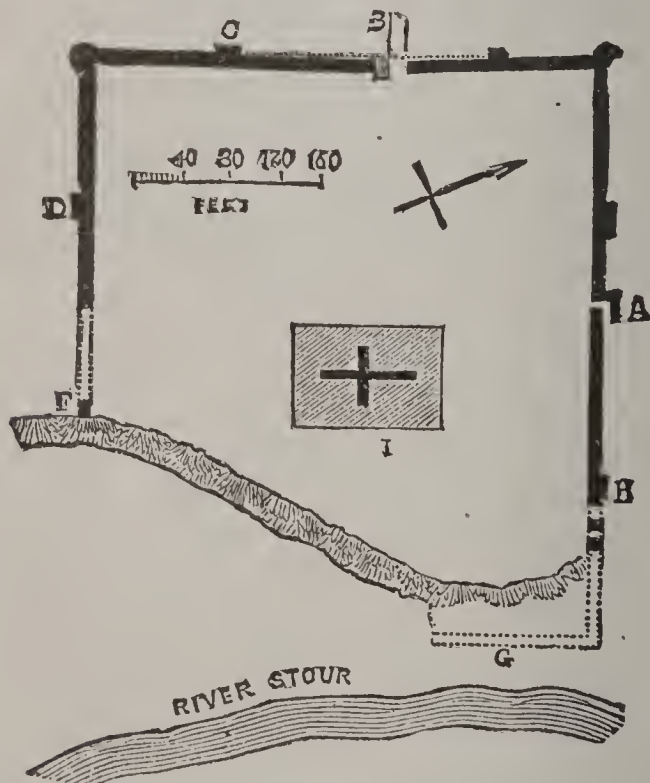
CAST-IRON.

fracture of steel. White cast-iron, when smelted from the argillaceous ores of the coal-measures, is of inferior value to the gray; much of it, indeed, being produced against the will of the iron-master, when the blast-furnace is working badly. But when obtained from pure ores and fuel it is the most valuable kind, because it contains fewer impurities, and has its carbon nearly all in the combined state, in which case it is best suited for the manufacture of wrought-iron and steel. Gray pig-iron contains carbon both in the combined and the uncombined (graphitic) state. In the grayest kind, uncombined carbon greatly prevails, and the fracture of the iron is more distinctly granular or scaly-crystalline than is the case with other varieties. Such cast iron is usually called No. 1. It is much softer, but fuses at a higher temperature than white pig-iron. It also becomes thinly liquid when melted, and expands slightly just before cooling—properties which render it extremely valuable for castings. As the grayness and graphite-like brightness diminish, the iron is known as No. 2, No. 3, and so on for several numbers, down to the close texture and light color of white pig-iron, No. 2 being but slightly different from No. 1, and No. 5 from white-iron in quality. No. 3 is intermediate between the extremes. When cast-iron is partly gray and partly white, it is called mottled iron. Cast-iron contains two to three per cent. of carbon, the maximum amount in steel being two; but steel is practically free from silicon, sulphur, and phosphorus, while cast-iron is not. The production of pig iron in the United States in 1901 was 15,878,354 long tons. Of this Pennsylvania produced 7,343,251 long tons; Ohio, 3,326,425 long tons; and Illinois, 1,596,850 long tons.

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CASTLE, n. *kās'sl* [It. *castello*; L. *castellum*; Sax. *castel*, a fortified place—from L. *castra*, a camp]: a building fortified; a fortress; one of the pieces in chess. **CASTLED**, a. *kās'sld*, furnished with castles. **CASTELLATED**, a. *kās'těl-lā'tēd*, having turrets and battlements like a castle. **FORE-CASTLE**, n. *fōk'sl* [*fore*, and *castle*]: a short deck in the fore part of a ship, at one time a castle. **CASTLE IN THE AIR**, an empty scheme; the forming of hopes on no solid foundation; visionary expectations. **CASTLERY**, n. *kās'sl-rĭ*, government of a castle. **CASTLE-BUILDING**, the forming in the mind of wild or visionary schemes. **CASTLE-BUILDER**, one who builds castles in the air; one who forms imaginary ideas and pictures. To **CASTLE**, in *chess*, to cover the king by a certain move.—**SYN.** of 'castle': fortress; fortification; stronghold; citadel.

CASTLE, *kās'sl*: building constructed with a view to repelling attack. The root of the word is the same as that of *casa*, a little house or hut, and probably means a driving off or repelling; and it is worthy of notice, in confirmation of this view, that in Welsh the radical syllable *cas*, signifies a castle, separated, also hatred, malice, etc. The *castella*, left by the Romans in Britain and elsewhere, were con-



Plan of Roman Castrum at Richborough:

A, postern gate; B, decuman gate; C, D, square towers; F, corner of south wall projecting over the cliff; G, return wall overthrown; H, site of tower in north wall; I, surface of subterranean building.

structed on the general model of their stationary encampments (*castra stativa*) (see **CAMP: ENCAMPMENT**); and though they may have suggested the castles of the middle ages, they differed from them in being designed for military purposes only, and not also as places of permanent residence. Even Burgh castle, in Suffolk, anc. Garamonium, and Richborough castle, in Kent, anc. Rutupiae, were en-

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campments or fortresses, rather than castles. The accompanying ground-plan, from Roach Smith's work on the *Antiquities of Richborough* and other places in Kent, shows the form of the remains of the most remarkable Roman castellated fort in Britain.

Besides these monuments of the military occupation of the island by the Romans, traces are found in various parts of the country of encampments or castles, which are ascribed to its aboriginal or early inhabitants. These are generally on the tops of hills; as, for example, the Herefordshire beacon, on the Malvern hills; Moel Arthur, in Flintshire; Chem castle, in Cornwall; the Maiden castle, in Dorsetshire; the Caterthuns, near Brechin, in Forfarshire; the Barmkin of Echt, in Aberdeenshire. It is probable that the Saxons adapted the Roman castles to a certain extent to their modes of defense, and traces of Saxon, and even Norman workmanship are found in structures believed



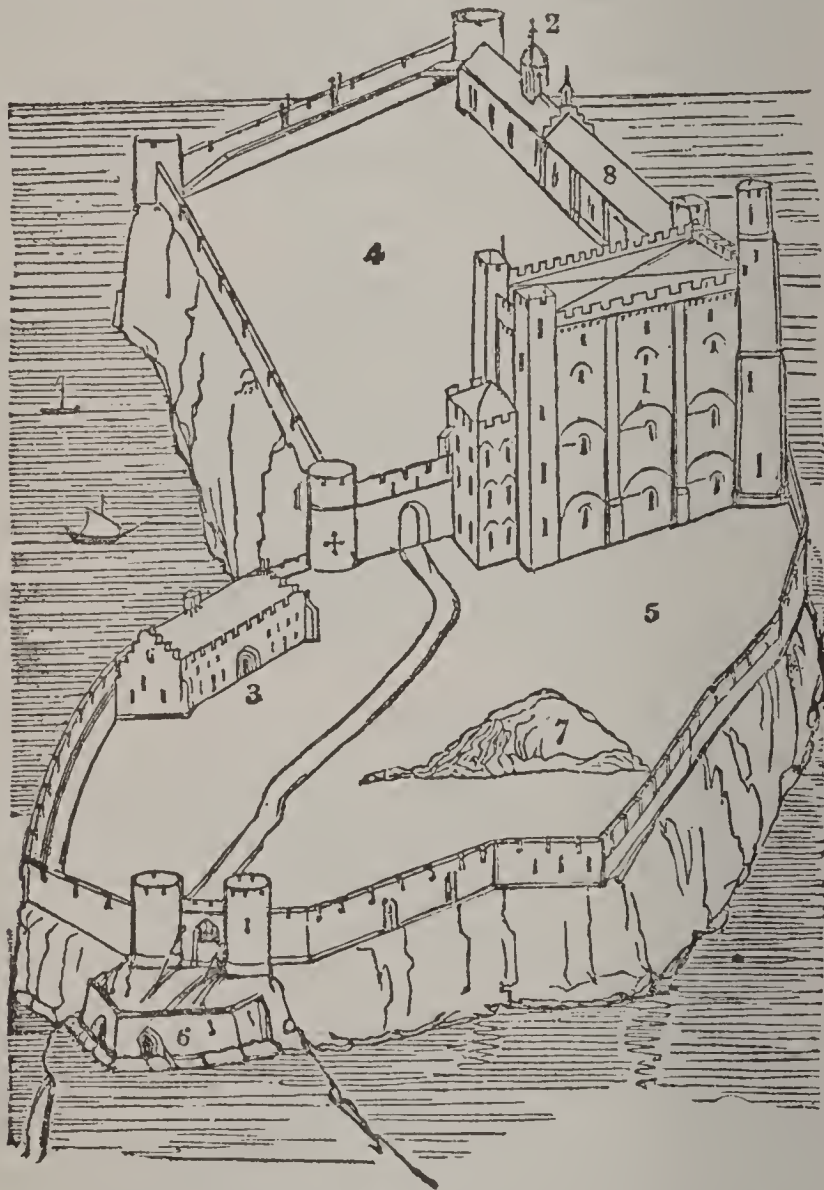
Roman Castellum.—From Vatican Virgil.

to have been originally Roman. One very frequent change consisted in raising a mound of earth on one side of the walls on which the keep or citadel was erected. The Decuman and Prætorian gates were also, as at Portchester, converted into the fortified entrances peculiar to the castellated structures of the middle ages. But of castles designed for residence as well as defense, there are few or none of higher antiquity than the Conquest. They were part of the organization of the feudal system—castle-guard being one of the duties which the tenants were held bound to pay in return for their lands; and till that system was developed by the Normans the residences of persons of importance were probably guarded only by their domestic retainers, or, in extraordinary circumstances, perhaps by the national militia. The absence of strongholds is said to have been a reason why William the Conqueror so easily became master of the kingdom; and it was as a protection against the resentment which the Conquest occasioned that most of the great Norman castles of England were built. As these castles grew in strength by the additions and improvements of each generation, they afforded their possessors the means not only of security from their fellow-subjects, but of independence as regarded the central gov-

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ernment. The lord of every C. became a petty tyrant; and no small portion of the history of England, and, indeed, of Europe altogether, during the feudal period, consists of an account of the attempts which were made by the monarch to destroy what Matthew Paris has emphatically designated as 'these nests of devils and dens of thieves.' Of castles of this description, it is said that in England, in the reign of Stephen (1135-54), no fewer than 1115 were built.

The Norman C., the most complete structure of the kind, was generally surrounded by a moat or ditch; and in order



A NORMAN CASTLE.—From an Ancient Drawing published in Grose's *Military Antiquities*:

1. The Dungeon; 2. Chapel; 3. Stable; 4. Inner Bailey; 5. Outer Bailey; 6. Barbican; 7. Mount; 8. Soldiers' Lodgings. The Mount is supposed by Grose to be the Court-hill, where the lord dispensed justice, and where it was also executed.

that the ditch might be readily filled with water the site chosen was usually either on the banks of a river or on a peninsula running into a lake. In the latter case the ditch was merely a deep cut made through the neck of land, by means of which the C. and its surroundings

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wer, converted into an island. On the inner side of the ditch mounds were constructed, surmounted with walls and towers, both of which, particularly the towers, were supplied with battlements and bastions. The entrance-gates also were protected by towers, usually of great strength. The communication was by a bridge, sometimes of stone, usually of wood, which was made to draw up and down; and the entrance, in addition to thick folding-doors, was protected by a portcullis (q.v.), which was dropped down through grooves in the masonry at the sides. The gateway, in castles of the larger sort, was further defended by a barbican (q.v.). Passing the external wall, one entered the bailey (q.v.), which sometimes consisted of several courts, and contained the barracks, magazines, well, a chapel, and sometimes even a monastery. The only portion of the C. which was always spoken of as distinguished from the bailey, was the keep (q.v.) or citadel, which corresponded to the *prætorium* of the Roman fortification. The keep was a species of internal C., more strongly defended than any other portion of the fortress, and placed in the most advantageous position, so as to afford a last resort to the garrison when driven from the external works. As the keep had the same design as the C. itself it contained most of its appliances, even to a chapel, when large and complete. The keep was also called the dungeon or donjon (q.v.). An excellent example of a keep is seen at Rochester castle. The best known is probably that at Windsor, so prominent an object in the surrounding landscape. The protection which the walls of the C. afforded to the retainers of a baron, in a state of society in which life and property were extremely insecure, naturally led to the construction of houses around the moat, and to this custom a very large number of the towns in England and on the continent of Europe owe their origin. Along the banks of the Rhine, this process of town-formation may be seen in all its earlier stages; from the few peasants' houses and the village church nestling under the ivy-covered ruin on the cliff, to the large and prosperous city of Coblenz. Strange as it may seem, the existence of these castles may be regarded not only as a cause, but as an effect of a certain feeling of security on the part of the surrounding population; for where a country was thoroughly insecure, the risk of the castles falling into the hands of the enemy, and thus proving a source not of protection but of oppression, was so great as to prevent their erection. It is on this ground that Sir Walter Scott explains the slight character of the fortresses on the Scottish border, notwithstanding centuries of warfare. 'It was early discovered that the English surpassed their neighbors in the arts of assaulting and defending fortified places. The policy of the Scotch, therefore, deterred them from erecting upon the borders buildings of such extent and strength, as being once taken by the foe, would have been capable of receiving a permanent garrison. To themselves, the woods and hills of their country were pointed out by the great Bruce as their safest bulwarks; and the maxim of the Douglasses, that "it was better to

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hear the lark sing than the mouse cheep," was adopted by every border chief.' For these reasons, 'we do not find, on the Scottish borders, the splendid and extensive castles which graced and defended the opposite frontier. The Gothic grandeur of Alnwick, of Raby, and of Naworth, marks the wealthier and more secure state of the English nobles.' The residence of the Scottish chieftain 'was commonly a large square battlemented tower, called a *keep* or *peel*, placed on a precipice, or on the banks of a torrent, and, if the ground would permit, surrounded by a moat' (Introduction to Scott's *Minstrelsy*). See the very valuable work by G. T. Clark, *Medieval and Military Architecture in England* (2 vols. 1884).

CASTLEBAR, *kās-sl-bar'*: capital of the county of Mayo, Ireland, 159 m. w.n.w. of Dublin; on the Castlebar river, near the head of a valley at the n.w. end of the great limestone plain which includes the greater part of the counties of Roscommon, Sligo, Galway, and Mayo. Here the Irish, in the rebellion of 1641, massacred the English parliamentary army. In 1798, the French general, Humbert, held the town for a fortnight. Pop about 5,000.

CASTLE GARDEN: in New York; extreme s. point of Manhattan Island, on the Battery Park. It was originally the site of an earthwork fortification erected by the early Dutch settlers; was gradually enlarged and converted into a stone fort of great strength in its day; and for many years was the official residence of the Dutch govts. of New Amsterdam. The English, capturing it, named it Fort James; the Dutch, recapturing it, called it Fort William Henry. After the revolutionary war the fort was demolished; 1805 a new one was built and named Castle Clinton; and 1847 the place was turned into a pleasure resort under its present name. During 1855-1891 it was used by the N. Y. Board of Emigration as a landing depot, and the federal govt., taking charge of emigration matters in New York, opened a new landing depot on Ellis Island 1892, Jan. 1. C. G. in 1896 was made a public aquarium.

CASTLEMAINE, *kas'sl-mān*: town of Australia, province of Victoria, at the junction of Barker's and Forest creeks, 65 m. n.w. of Melbourne, with which it is connected by the Victoria railway. It was a place of importance in the early days of gold mining, the neighboring mines being among the first discovered. Pop. (1891) 6,082.

CAS'TLE PEAK: one of the peaks of the Sierra Nevada, Cal., n. lat. abt. 38° 10', whose outline, from some points of view, roughly suggests a fortress. Its height is estimated 13,000 ft.

CASTLEREACH', LORD: see LONDONDERRY, MARQUIS OF.

CASTLES, in Heraldry: often given as charges in the shields of persons who have reduced them, or been the first to mount their walls in an assault. The practice of heralds, in this as in other respects, has not been consistent, as it is recorded that in 1602 a castle was granted by William Cambden, Clarenceux king of arms, to William Frear, doctor of physic.

CASTLETON (N. Y.): see STATEN ISLAND.

CASTLETOWN—CASTORIDÆ.

CASTLETOWN, *kăs'sl-town*: formerly the capital and seat of government of the Isle of Man; called in Manx *Balley Cashtal*, or the Town of the Castle. C. is on the margin of Castletown Bay, near the s. extremity of the island, and surrounds Castle Rushen, a Danish fortress of prodigious strength, having walls from 12 to 18 ft. in thickness, built of limestone found on the spot, which is of so imperishable a nature that the sharp angles of the keep retain the marks of the builder's chisel, though completed in the 10th c. The castle was founded by Guthred II. of the Orrys kings of Man, and having been added to from time to time it is now an impressive pile of building. It underwent a six months' siege by Robert Bruce 1313. The keep is used as the public jail of the island, and the other portion of the castle consists of public offices, officers' apartments, and accommodation for the chancery and other superior courts.

Being in the neighborhood of the bold coast scenery of the Calf of Man, Spanish Head, etc., C. is a desirable resort for the numerous tourists who frequent the Isle of Man. Ship-building has of late made progress. Near C. is King William's College, founded 1830. Pop. (1891) 2,320.

CASTOCK, n. *kăs'tök* [a corruption of *kale-stock*]: in *Scot.*, the core or pith of a stalk of coleworth or cabbage; the stalk itself; also spelled **CUSTOCK**.

CASTOR, n. *kăs'tör* [L. *castor* — from Gr. *kastōr*, a beaver]: a beaver; also a drug taken from it. **CAS'TORINE**, n.: see under **CASTOREUM**.

CASTOR [Lat. myth. name]: see **CASTOR AND POLLUX**.

CASTOR, *kăs'tor*, **ANTONIUS**: 1st c.: Roman botanist, reported to have lived in health for more than 100 years. Pliny quotes him. His botanical garden is the earliest known.

CASTOREUM, n. *kăs-tör'ě-ŭm* [L. *castörëum*, a secretion of the beaver—from *castor*, a castor or beaver]: a substance secreted from the follicles in two glandular sacs, closely connected with, but quite distinct from, the organs of reproduction in the beaver (q.v.), and at one time held in the highest repute in medicine, although now regarded as almost inert, and chiefly used by perfumers. The C. sacs are pear-shaped, and it appears in commerce in these sacs themselves, connected in pairs as they are taken from the animal. C. is produced both by the male and by the female beaver.

In Hudson's Bay commerce, ten pair of them are equal in value to one beaver skin. Russian C. is of much higher value than American. C. was well known to the ancients. From the time of Hippocrates it was regarded as having a specific influence over the uterus, and is still in use in the n. of Europe. It was formerly esteemed a most valuable medicine also in hysteria, catalepsy, and other spasmodic diseases. **CAS'TORINE**, n. *-tör-in*, a chemical substance contained in castoreum.

CASTORIDÆ, *kăs-tor'ě-dē*: family of *Mammalia*, of the order *Rodentia*, of which the beaver (*Castor*) is the type, and in which, besides the beaver, the coypu (*Myopotamus*), and the *musquash*, some naturalists include other genera

commonly regarded as belonging to the Mouse and Rat family (*Muridæ*), as the lemmings and voles.

CASTOR-OIL, n. *kûs'tôr-oyl* [said to be a corruption of *castus-oil*, the sacred oil ; but perhaps only an adaptation of *castor*, the drug from the beaver (see CASTOREUM)]: fixed oil obtained from the seeds of the C. O. plant. In extracting the oil, the seeds are first bruised between heavy rollers, and then pressed in hempen bags under a hydraulic or screw press. The best variety of oil is thus obtained by pressure in the cold, and is known as *cold-drawn* C. O.; but if the bruised and pressed seeds be afterward steamed or heated, and again pressed a second quality of oil is obtained, apt to become partially solid or frozen in cold weather. In either case the crude oil is heated with water to 212° , which coagulates and separates the albumen and other impurities. Exposure to the sun's light bleaches the oil, and this process is resorted to on the large scale. When pure and cold-drawn, C. O. is of a light-yellow color ; but when of inferior quality, it has a greenish, and occasionally a brownish, tinge. It is somewhat thick and viscid. Its specific gravity is high for an oil, being about 960 (water being taken as 1,000). It is miscible with alcohol or spirits of wine and ether. Reduced to a temperature of 0° F., it does not become solid ; but exposed to the air, it very slowly becomes rancid, then dry and hard, and serves as a connecting-link between the drying and non-drying oils. It has a nauseous smell, and an acrid, disagreeable, and sickening taste, which may be overcome by the addition of a little magnesia. The principal acid present in it is *ricinolic* acid ($\text{HO}, \text{C}_{36}\text{H}_{73}\text{O}_5$), which is allied to oleic acid.

C. O. is one of the most convenient and mildest of purgative medicines. Given in doses of one or two tea-spoonfuls with a little peppermint-water, it forms a gentle laxative for habits easily acted on by medicine ; while a dose of a table-spoonful, or a little more, will almost always succeed if it remains on the stomach. The only serious objections to the use of C. O. are its disagreeable flavor and the sickness often produced by it ; some persons can avoid this by floating the oil in hot coffee, which is said to remove its nauseous quality.

The adulterations of C. O. may be various. Several of the fixed oils, including lard, may be employed. The best test of its purity is its complete solubility in its own volume of absolute alcohol, which other fixed oils do not possess. Croton oil (q.v.), a dangerous substance, is occasionally added, to increase the purgative powers of the oil.

The CASTOR-OIL PLANT (*Ricinus communis*) is native of the s. of Asia, but now naturalized in the s. of Europe, and other warm regions of the globe. The genus *Ricinus* belongs to the nat. ord. *Euphorbiaceæ*. It has panicled flowers, with 3-5 partite perianth ; the fruit a tricocous capsule, with one seed in each cell, the outside of the capsule generally covered with soft spines. The castor-oil plant is often cultivated in gardens in the middle, and even in the n. parts of Europe, where it is only an annual, attaining a height of 3-10 ft., but highly ornamental by

CASTOR-OIL—CASTOR AND POLLUX.

its stately growth, its large, broad, palmato-peltate, 7-9-fid leaves, $\frac{3}{4}$ -2 ft. in diameter, and its generally purplish hue. Its flowers are produced in long glaucous racemes.



Castor-oil Plant :

a, end of a branch, with leaves and flowers ; *b*, a capsule.

In warmer climates it is perennial, and its stem becomes arborescent, attaining even 30 ft. in height, with a corresponding thickness, so that ladders are used for climbing it. Different species which have been described, are probably mere varieties. It was known to the ancients, and appears to have been valued by them. Its seeds have been found in Egyptian sarcophagi. From the resemblance of its seeds to an insect called *Ricinus* it received that name from the Romans. The seeds are oval, and about four lines long. They are valued chiefly for the oil which they yield, on account of which the plant is cultivated in the Levant, Spain, Provence, the West Indies, Brazil, the United States as far north as New Jersey, and in other tropical or warm temperate countries. Although castor oil is used chiefly in medicine, it is not unfit for lamps and for oiling the wheels of machinery. The streets of Lima are lighted, and the machines used in the works of the sugar-plantations of Peru are oiled with it. The appearance of the castor-oil plant obtained for it the name of *Palma Christi*, by which it is still sometimes called. Its seeds were formerly known as *semina cataputivæ majoris*.

CASTOR and POLLUX, *kās'tŭr*, *pŏl'lŭks* [Latin mythical names]: the two principal stars in the constellation Gemini

CASTOR AND POLLUX—CASTREN.

(q.v.); so called from Castor and Pollux, sons of Leda and of Tyndareus who was king of Lacedæmon; another legend was that they were sons of Jupiter by Leda. Their sister was the famous Helen of Troy. The legend was that on account of their mutual attachment, Zeus placed them among the stars. See DIOSCURI.

CASTOR AND POLLUX, *kās'tōr, pōl'lūks* [Latin mythical names]: name given to a meteor seen at sea, which, under the form of twin balls of fire, attaches itself to the masts of ships. Sailors predict fair weather from its appearance. Sometimes, however, only one ball of fire is seen; the meteor is then called Helena, and it is regarded as foreboding a storm. Shakespeare makes mention of this superstition in the *Tempest* (act. i., scene 2).

CASTORS, n. *kās'tōrs* [see CASTERS]: small wheels on the legs of tables, sofas, etc.

CASTRAMETATION, n. *kās'trā-mē-tā'shūn* [L. *castra*, a camp; *metor*, I measure]: the art or practice of encamping: see CAMP: ENCAMPMENT.

CASTRATE, v. *kās'trāt* [L. *castrātus*, deprived of generative power]: to deprive of the power of procreation; to emasculate: to geld. 'CAS'TRATING, imp. CAS'TRATED, pp. emasculated; purged. CASTRA'TION, n. -*trā'shūn*, the act of emasculating; in males the removal of the testicles; in females the removing or mutilating of the ovaries (known as 'spaying'): see EUNUCH.

CASTREL, n. *kās'trēl* [F. *crecérelle*]: a kind of hawk resembling the sparrow-hawk: same as KESTREL.

CASTREN, *kās-trān'*, MATTHIAS ALEXANDER: 1813–1852, May 7; b. near the Lappish boundaries of Finland: greatest authority in regard to the Finnish people and language. He received his earliest instruction in the town of Tornea, and afterward studied at Helsingfors. About 1838, he undertook a pedestrian excursion through Finnish Lapland in order to extend his knowledge of the language and literature; and, in 1840, another through Carelia, to collect ballads, legends, etc., illustrative of Finnish mythology. On his return, he published in Swedish a translation of the famous Finnish poem, *Kalevala*, the metre and style of which have been imitated by Longfellow in his poem of *Hiawatha*. Aided by the government of his native province he commenced his researches among the Finnish, Norwegian, and Russian Laplanders, and among the European and Siberian Samoyeds. Appointed linguist and ethnographer to the St. Petersburg Acad., C., 1845–49, prosecuted his investigations as far e. as China, and as far n. as the Arctic Ocean, and, returning was appointed first prof. of the Finnish language and literature at the Univ. of Helsingfors. While preparing for publication the vast materials which he had collected, he died from exhaustion—a martyr to science. Before his death, appeared *Versuch einer ostjåkischen Sprachlehre nebst kurzen Wörterverzeichnis* (St. Petersburg, 1849), first instalment of his *Northern Travels and Researches*. He also wrote *Elementa Grammaticæ Syrjäenæ* (Helsingfors, 1844), and *Elementa Grammaticæ*

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Tscheremissæ (1845); *On the Influence of the Accent in the Lappish Language* (St. Petersburg, 1845); *De Affixis Personalibus Linguarum Altaicarum* (Helsingfors, 1850), etc.

CASTRES, *kâst'r*: town of France, dept. of Tarn; on both sides of the river Agout, 46 m. e. of Toulouse. The two parts of the town are connected by two stone bridges. In the middle ages C. was celebrated for its Benedictine abbey, the heads of which exercised a temporal sway over the place. Later it was one of the strongholds of the reformed party, but it was forced to submit, and its fortifications were demolished in the reign of Louis XIII. C. has beautiful promenades, shadowed by fine alleys of trees, and in the neighborhood is a remarkable rocking-stone, 11 ft. high, and weighing some 30 tons. It is of egg-shape, and rests upon its smaller end; a strong push is sufficient to cause its vibration. C. is a busy manufacturing place. Its fine wool-dyed goods are especially famous, and it has also manufactures of linen, leather, paper, soap, etc. Pop. (1881) 22,056; (1891) 27,509.

CASTRI, or KASTRI, *kâs'trê*: village of modern Greece, govt. of Phocis; on the s. declivity of Mount Parnassus; noticeable as occupying a portion of the site of the ancient Delphi (q.v.). The famous Castalian spring now called the fountain of St. John, is between 200 and 300 yards e. of the village. Beside it grows a plane-tree, the only one in C., which is fabled to be that planted by Agamemnon.

CASTRO, *kâs'tro* (anc. *Mitylene*): seaport town of Asiatic Turkey, cap. of the island of Mitylene; on the e. coast, about 55 m. n.w. of Smyrna. It is surrounded with walls, and defended by a castle, and its streets are narrow and dirty. Remains of the ancient town are found to the west. Pop. 6,500.

CASTRO, *kâs'tro*, GUILLEN DE: 1569–1631; b. Valencia: Spanish dramatist. He had a checkered career, at one time capt. of horse, at another gov. of a Neapolitan fortress; patronized and pensioned by the great, but buried, it is said, by charity. He was a friend and imitator of Lope de Vega, who dedicated a play to him, and whom he helped in the festival of the canonization of San Isidro, when C. won a prize in a literary tournament. He lived chiefly at Madrid, and wrote about 40 plays, the most celebrated of which is *Las Mocedades del Cid*. His *Comedies* appeared at Valeneia 1621. Lord Holland wrote C.'s life with that of De Vega, 1817. See Ticknor's *Hist. Sp. Literature*, vol. 2, pp. 300–309.

CASTRO, HENRI: 1786–1861; b. in France, of Portuguese descent. He was an officer of the national guard, emigrated to the United States 1815, and was Neapolitan counsel at Providence, R. I., 1827, but returned to Paris 1838 as partner in Lafitte's banking house, and was consul-gen. there for the republic of Texas 1842. C. acquired a grant of land on the Medina river, began 1840 to send emigrants to Galveston, and founded Castroville, Quihi, Vandenburg, and Dhanis, all in what is now Medina co., Tex., 1844–47. By 1846 he had sent over 26 vessels with 485

families and 457 unmarried persons, mostly from Alsace. He died at Monterey, Mexico.

CASTRO, *kâs'tro*, INES DE: d. 1355; daughter of Pedro Fernandez de C., and sprung from a branch of the royal family of Castile: her mournful fate is the subject of several tragedies and poems. She was appointed lady-in-waiting to the wife of Dom Pedro, son of Alfonso IV. of Portugal. Her beauty captivated Dom Pedro, and, after the death of his wife, 1345, he secretly married Ines. Their stolen interviews took place in the convent of St. Clara, at Coimbra, until the secret was discovered and revealed to the king, who was made to believe that this union might prove injurious to the young Ferdinand, son of Dom Pedro by his deceased wife. Questioned by his father, Dom Pedro had not the courage to reveal the whole truth, though he refused to marry another. In the king's council, it was determined that Ines must die. To see this sentence executed the king hastened to Coimbra, while his son, Dom Pedro, was engaged in hunting, but the sight of the beautiful Ines, who, with her children, cast herself at the feet of the king, and prayed for mercy, diverted him for a few moments from his purpose. His advisers, however, soon obtained from the king permission to execute the sentence, and, in the course of an hour after the interview, Ines fell pierced by the daggers of assassins. Dom Pedro attempted a revolt against his father, but was pacified by the queen and the Abp. of Braga, and promised not to seek revenge for the death of Ines. Two years afterward the king died, having shortly before his death recommended the murderers of Ines to leave Portugal and seek shelter in Castile, where Peter the Cruel was then ruling. As several of Peter's nobles had escaped into Portugal to avoid his oppression, Peter proposed to Dom Pedro an exchange of fugitives, to which the latter (now king of Portugal) consented. Two of the assassins accordingly were delivered up, and were tortured and burned. Two years afterward, the king, in an assembly of the nobility, declared that he had been lawfully married, by papal sanction, and in the presence of the Abp. of Guarda, to Ines de Castro. When this statement had been confirmed by several testimonies the king gave orders that the corpse of Ines should be removed from its grave, clothed in royal attire, with a crown on the head, and seated on a throne, should receive homage as queen. This strange ceremony was performed, the nobles of Portugal bowing before the enthroned dead, and kissing the hem of the royal robe. The body was then removed to Alcobaça followed by the king, with the bishops and the nobility, all on foot. A splendid marble monument was erected over the grave of Ines, surmounted by her statue, wearing a crown.

CASTRO, JOÃO DE: fourth viceroy of the Portuguese Indies: 1500, Feb.—1548, June 6; b. Lisbon; son of its civil gov. A brilliant scholar in youth, he served at Tangier 1518 and 1535, with his friend the Infante Dom Luis, at the siege of Tunis, where he refused knighthood from Charles V. Though of ancient lineage, lofty character, and dis-

CASTRO DEL RIO—CAST-STEEL.

tinguished gallantry, he was very poor, and to improve his fortunes went to Goa abt. 1539 with his uncle, G. de Noronha, enlisted among 'the bravest' for the relief of Diu, and explored the Red Sea under E. de Gama, who knighted C.'s son, a boy of 13 years, in compliment to the father. C.'s account of hydrographic researches in this expedition, preserved in the British Museum, was published, Paris, 1833, and has much scientific merit. Returning to Portugal he was put, 1543, in command of a fleet against the pirates, and 1545 sent with six ships to India in place of De Souza. His last three years were filled with severe labors and brilliant exploits. One of his sons was killed before Diu, but he drove the Moors from that town 1546, overthrew Mahmoud, King of Cambodia, defeated Adhel Kahn's great army, took Baroach, subdued Malacca, and sent Meniz into Ceylon. Camoens celebrated him as *Castro forté*, the strong. John III., who did not favor him, was constrained to reward his great services by the appointment of viceroy, 1547, Oct. 13. He died at Goa in the arms of his friend St. Francis Xavier. A statue was erected at Goa in his honor; his bones were removed 1576 to the convent of Bemfica, Portugal, and placed under a monument. He left MS. accounts of his voyages to Goa and Diu. A life of him by De Andrada, 1651, was translated into English by Sir Peter Wyche 1664.

CASTRO DEL RIO, *kâs'trô dêl rê'ô*: town of Andalusia, Spain, on a slope on the right bank of the Guadajocillo, 16 m. s.e. of Cordova. A portion of the old town is surrounded by ruinous walls; the new town outside of these has some good streets. It has manufactures of woolen and linen fabrics, earthenware, etc., and considerable trade in agricultural produce. Pop. 10,260.

CASTRO-GIOVANNI, *kâs-tro-jô-vân'nê*: town of Sicily, province of Caltanissetta; 13 m. n.e. of the chief town of the province, on a remarkable fertile plateau, which rises precipitously 4,000 ft. above sea-level. C. occupies the site of anc. *Enna*, of which Ceres was the presiding goddess, and her most famous temple was here. The neighborhood was the scene of Proserpine's mythical abduction by Pluto. In connection with the Punic and servile wars Enna was conspicuous in early history. There are no remains of the old town. A castle and other buildings of Saracenic origin still stand. The district yields large quantities of sulphur. Pop. about 20,000.

CASTRONUOVO, *kâs-trô-nô-ô'vô*: town of Sicily, province of Palermo, 25 m. n. of Girgenti. It is on a hill, is fortified, and in its vicinity are quarries of fine marble. Pop. 5,000.

CASTROVILLARI, *kâs-trô-vîl-lá'rê*: town of s. Italy, province of Cosenza, 34 m. n. of Cosenza; on an eminence surrounded by mountains, is partially fortified, and has an old massive castle, and a trade in wine, manna, silk, etc. Pop. 10,000.

CAST-STEEL: term, until lately, confined to steel made by melting blister-steel (q.v.), obtained by the old cementation process. Through this simple operation of melting it

CASTUERA—CASUARINA.

in crucibles, which was invented by an Englishman named Huntsman about the middle of last c., steel was first readily made perfectly homogenous, and fitted for the production of the finer kinds of tools and cutting instruments. The crucibles are made of fire-clay, mixed with a small proportion of the material of old ones and coke. They are very carefully prepared and annealed, but, notwithstanding this, the heat of the furnace is so high that they can be used only three times. Each crucible contains 30 to 40 lbs. of steel, which is poured, when melted, into cast-iron ingot-molds previously smoked. The name 'cast-steel,' however, is no longer confined to steel so made, because Bessemer steel, though produced by a quite different process, is truly a cast-steel. In Sheffield, the finer kinds of cast-steel are now sometimes called 'crucible steel;' but since puddled steel, which, like the Bessemer, cannot be used for fine cutlery, is also cast in crucibles, such a term is not sufficiently distinctive.

CASTUERA, *kās-tō-ā'rá*: town of Estramadura, Spain, 68 m. e.s.e. of Badajoz; near the right bank of the Guadalquivir. It has several good streets, manufactures of brick, earthenware, etc., and a trade in agricultural produce; some weaving is done. Pop. 6,870.

CASUAL, a. *kāzh'ū-āl* [F. *casuel*—from L. *casuālis*, fortuitous—from L. *cāsus*, a fall]: happening without design; coming to pass without being expected or foreseen; accidental. **CAS'UALLY**, ad. *-li*, without design or purpose; accidentally. **CASUALTY**, n. *kāzh'ū-āl-tī*, an injury or hurt to the body by accident; death or other misfortune by accident. **CASUAL-WARD** [shortened from *casualty-ward*]: in a hospital, a ward assigned to the treatment of injuries from accidents.—**SYN.** of 'casual': accidental; incidental; contingent; occasional; fortuitous.

CAS'UAL POOR: persons temporarily relieved without being admitted to the roll of permanent paupers: see **POOR-LAWS**.

CAS'UALTIES OF SUPERIORITY: in the feudal law of Scotland, such emoluments arising to the superior as depend on uncertain events: see **WARD-HOLDING**.

CASUARINA, *kāz-u-ar-ī'na*: genus of trees of the nat. ord. *Amentaceæ*, sub-ord. *Casuarineæ*, which sub-ord. is regarded by some as a distinct order. The trees of this genus are almost exclusively Australian; one only, *C. equisetifolia*, being found in the South Sea islands, the Indian archipelago, the Malayan peninsula, and on the e. side of the Bay of Bengal as far n. as Arracan. Some of them are large trees, producing timber of excellent quality, hard and heavy, the *Beef-wood* of the Australian colonists, so called from the resemblance in color to raw beef. *C. equisetifolia* is called in Australia the **SWAMP OAK**. It is a lofty tree, the *Toa* or *Aitoea* of the Society Islands, where it grows chiefly on the sides of hills, and where its wood was formerly used for clubs and other implements of war. It has been introduced into India and is there much valued, as its wood bears a great strain, and is not readily injured by submersion in

water. The hardness and durability of this wood led the earlier voyagers to the South Sea islands to designate it *iron wood*. *C. quadrivalvis* is the SHE OAK of New South Wales. CASSOWARY TREE is a popular generic name of the *Casuarinæ*. Some of the species are shrubby bushes. All of them have a very peculiar appearance, their branches being long, slender, wiry, drooping, green, jointed, with very small scale-like sheaths instead of leaves. They resemble arborescent *Equisetaceæ*. The fruit consists of hardened bracts, collected in a *strobilus*, or cone, and inclosing small winged nuts. The flowers have neither calyx nor corolla; the stamens and pistils are in separate flowers, the male flowers with only one stamen, the female flowers with a one-celled ovary, the male flowers in spikes, the female flowers in dense heads. More than 20 species are known.

CASUIST, n. *kăzh'û-îst* [F. *casuiste*, a casuist—from Sp. *casuista*—from L. *câsus*, a case]: one who reasons on *cases* put; one who resolves doubts of conscience in matters of duty. CAS'UIS'TIC, a. *-îs'tîk*, or CAS'UIS'TICAL, a. *-tî-kăl*, pertaining to casuistry; relating to cases of conscience. CAS'UIS'TICALLY, ad. *-lî*. CASUISTRY, n. *kăzh'û-îs trî*, the science or system of rules that undertakes to decide in matters of conscience as to what is lawful or unlawful; the art of quibbling; the art of drawing fine distinctions.

CASUISTRY, *kăzh'u-is-trî*, called by Kent the *dialectics of conscience*: that branch of theology and morals which professes to deal with very delicate moral questions—*casus conscientiæ*—and which supplies rules and principles of reasoning for resolving the same; drawn partly from natural reason and equity and partly from the authority of Scripture, the canon law, councils, fathers, etc. C. has been, and still is, studied chiefly by Rom. Cath. theologians; but at one period Protestant divines also gave much attention to the science. The rudiments of it are seen in antiquity. Traces of it are found in the Stoic philosophers of ancient Greece. This is not to be wondered at, for C. is not, in its essence, a device of the schoolmen, though the latter elaborated it into a science, but a natural expression of the intellect and moral nature of man when in circumstances of great perplexity. The sound and healthy reason of antiquity, however, was not usually under sufficient stress of conscience to be drawn into the morbid refinement, or rather the insidious corruption of morals found in certain Jewish and Christian writers. The *Talmud* (q.v.) contains an enormous accumulation of casuistical questions, while the sphere of Christian ethics in the middle ages often became a mere arena for unprofitable and pernicious disputations of this nature, as is seen in such works as the *Summa Raymundiana*, *Summa Astesana*, *Summa Bartholina*, which obtained their names from their respective compilers. At a later period, the Jesuits Molina, Escobar, Sanchez, Busenbaum, etc., became notorious for their abuse of ingenuity in the construction of moral puzzles, and for the flagrant immorality of some of their solutions, which still suffer

the vengeance' of Pascal's immortal satire. It is nevertheless indubitable that in the life of every man—now as formerly—*casus conscientie* will at times arise, when the higher laws of morality come into collision with subordinate conventional ones. The doubt as to what the path of duty is, what *ought* to be done, resulting from this collision, naturally and legitimately leads to many nice considerations. If these are carried on under the guidance of a pure conscience, no harm can ensue, but, indeed, much good. Such, however, is not the *perverted* C., 'the art of quibbling with God,' as M. Le Feore, preceptor to Louis XIII., called it, in which a man seeks to justify, by subtle quirks, his immoral actions. Mayer has published an account of all the writers on cases of conscience, ranging them under three heads—Lutheran, Calvinistic, and Romish—meaning by the last, writers in the Roman Church, or those Protestants who followed the manner of some writers of that church; for it is to be remembered that the 'perverted C.' was characteristic of only a class.

CASUS BELLI, *ka'sūs bēl'li*, a case of war: the reason alleged by one power for going to war with another. It is found impossible to reduce these causes or reasons to any definite code, inasmuch as an ambitious or aggressive power has no difficulty in *making* a reason to declare to others, without acknowledging the real reason.

CASWALL, *kāz'wall*, EDWARD: 1814, July 15—1878, Jan. 2: poet; b. Yately, Hampshire, England. He was educated at Brasenose College, Oxford; was perpetual curate of Stratford near Salisbury 1840–46; entered the Church of Rome 1847, and Dr. Newman's Oratory at Birmingham 1850. His *Lyra Catholica*, 1848, containing translations of all the hymns of the Roman Breviary and Missal, with some others, is among the most important contributions to English hymnody. He had been preceded in this field by Chandler, Mant, and Isaac Williams, and was followed by Neale; but some of his versions (as of *Jesu, dulcis Memoria* of St. Bernard, and *O Deus, ego amo te* of Xavier) have never been equalled, and many of them are widely used by almost all religious bodies. His *Poems* appeared 1858; *A May Pageant*, etc., 1865; and a complete edition of his *Hymns and Poems, original and translated*, 1873. His prose works *Sermons* (1846), are comparatively unimportant.

CASWELL, *kaz'well*, ALEXIS, D.D., LL.D.: 1799, Jan. 29—1877, Jan. 8; b. Taunton, Mass.; educator. He graduated at Brown Univ., 1822, and after filling the chair of languages at Columbian College, D. C., for a time, returned to Brown Univ., 1828 as prof. of mathematics and natural philosophy, which by division became that of mathematics and astronomy 1850. He was pres. of the univ. 1868–72, and one of the founders of the National Acad. of Sciences. C. published a *Memoir of John Barstow*, 1864. He died at Providence, Rhode Island.

CASWELL, RICHARD: 1729, Aug. 3—1789, Nov. 20; b. Md.; patriot. He removed to N. C. at the age of 17,

CASWELL.

was a member of the assembly 1754-71, and for the last year speaker of the house. As col. of militia he commanded Gov. Tryon's right wing at the battle of Allamance, 1771, May 16. Embracing the cause of liberty, he was a delegate to congress 1774-5; treasurer of the s. dist. of N. C. 1775, Sep ; president for three years of the provincial congress, which, during that time, framed the state constitution; and gov. 1777-79. As col. of minute-men he defeated the loyalists under McDonald at Moore's creek 1776, Feb. 27, and was thanked by congress and appointed gen. He was engaged at Camden 1780, made speaker of the senate, comptroller-general 1782, again gov. 1784-86, member of the convention which framed the federal constitution 1787, and of that in N. C. which ratified it 1789. He was struck with paralysis 1789, Nov. 5, while presiding in the state assembly, and died at Fayetteville, North Carolina.

CAT, n. *kāt* [Ger. *katze*; Icel. *kottr*, a cat: F. *chat*—from mid. L. *catus*: Sp. *gato*]: a well-known domestic animal. CAT-BAND, a bar of iron for securing a door. This name is given to the strong hook used on the inside of a door or gate, which, being fixed to the wall, keeps it shut; a chain drawn across the street for defense in time of war. CATGUT, n. strings for musical instruments made of the entrails of animals. CAT'S-PAW, a term of contempt, applied to a person who is made the tool of another; a dupe; a puff of wind. CATKIN, n. *kāt'kīn* [*kīn*, little]: a spike of small unisexual flowers, resembling a cat's tail (see CATKIN). CAT-FISH, a large and destructive sea-fish; called, also, *sea-wolf*. CAT-HEAD, a projecting timber at the bow of a ship through which the ropes pass for holding the anchor. CAT-HEATHER, a finer species of heath, *Erica tetralix* or *E. cinerea*, low and slender, growing more in separate upright stalks than the common heath, and flowering only at the top. CAT-HOLES, the name to the loop-holes or narrow openings in the walls of a barn. CAT-LIKE, stealthily, like a cat. CAT'-MINT, n. a wild plant, the *Nepēta catūriā*, ord. *Ľabiūtā*. CAT-POSY, the daisy, *Belīs perennis*. CAT-STEPS, the projections of the stones in the slanting part of a gable. CAT'S-CRADLE, a familiar play among children. A pack-thread is twisted on the fingers of both hands of one of the party in a certain manner, and then transferred to the hands of another. CAT'S-EYE, a greenish translucent quartz, esteemed as a jewel, and usually cut with a rounded top; quartz. CAT-BLOCK, in a *ship*, tackle used to raise the anchor. CAT-CALL, the loud noise made by the forcible emission of the breath through two fingers placed in the mouth; a squealing cry; a small squealing instrument. CAT'LING, n. the down or moss growing about walnut-trees; in *surg.*, a kind of knife. CAT-O'-NINE-TAILS: see in alphabetic order: also FLOGGING. CAT-AND-CLAY, the materials, straw and clay, of which a mud-wall is constructed in many parts of Scotland. CAT-AND-DOG, an old Scotch game, apparently an early form of cricket. CAT-AND-DOG LIFE, always quarrelling and snarling as the common manner of life. TO BE MADE A CAT'S-PAW, to be employed as the tool of another, as the medium of accomplishing his purposes—in allusion to the fable of the monkey who used the cat's paw to take the roasting chestnuts out of the fire. KILKENNY CATS, said to have fought so furiously and fiercely that the contest ended in leaving only their tails; applied to any municipal or personal combatants who are grievously injured without benefit accruing to either.

CAT [Lat. *catus*]: name sometimes extended to the whole family of quadrupeds designated by zoologists *Felidæ* (q.v.), genus *Felis* of Linnæus; sometimes more restrictedly applied to a section of that family, containing a number of its smallest species, the domestic cat and species most nearly allied to it. These are the subject of the present article. They all pursue their prey on the branches of trees, many of them there more than on the ground, and are most expert climbers, in which, however, they are rivalled by some of the other *Felidæ*.

The origin of the domestic C. is not ascertained; and by some naturalists it is described as a distinct species, under the name *Felis domestica*, at least a convenient provisional designation, until satisfactory reasons appear for referring it to some species existing in a wild state. By many, indeed, the domestic C. has been confidently pronounced to be a mere domesticated variety of the common wild C. (*Felis Catus*) of Europe and n. Asia; but to this there are many objections, the most important being that it is always smaller, contrary to the usually-observed effect of domestication in animals; and that in cats of the domesticated race which have run wild, and in their known progeny, there is no appearance whatever of a tendency to return to the type of the true wild cat.—Another opinion as to the origin of the domestic C. has obtained the assent of a considerable number of naturalists; that it is derived from the *Felis maniculata*, or Gloved C. of n. Africa, a species discovered by the celebrated traveller Rüppell. But Mr. Owen has stated a perfectly conclusive reason against identifying the domestic C. with the *Felis maniculata*, that the first deciduous molar tooth in the latter has relatively thicker crown, and is supported by three roots, while the corresponding tooth both of the domestic C. and of the wild C. of Europe has a thinner crown, and only two roots.

The certainty, however, that the C. existed as a domestic animal in ancient Egypt, indicates that its original is probably to be sought on the banks of the Nile, or in some of the countries from which the ancient Egyptians might most readily have obtained it. Of its rarity in Britain in former times, when the wild C. was common in all the woods which covered so much of the island, a curious evidence is afforded by a Welsh law quoted by Pennant—a law of the reign of Howel the Good (died A.D. 938)—fixing the prices of cats according to their age and qualities, beginning with a price for a kitten before it could see, and enacting that if any one stole or killed the C. that guarded the prince's granary, he was to forfeit a milk ewe, its fleece and lamb; or as much wheat as when poured on the C. suspended by its tail, the head touching the floor, would form a heap high enough to cover the tip of the tail.

The domestic C. has distinctive characteristics which are well-known: its purring, its mewing, and the other sounds which it makes, its aversion to wet its feet or fur, its love of heat and comfort, its stealthy manners when in quest of prey, its patient watchfulness, often fatal to mice, and other points of its natural history.

The delight which a C. takes in tormenting a mouse before killing it has sometimes been mentioned as an apparent exception to the general character of goodness manifest in the instincts of animals. It is noticeable, however, that when the prey is a bird instead of a mouse, a C. immediately inflicts a mortal wound, as if aware of its greater power of escape.

The eye of the C. is capable of much contraction and

dilatation of its pupil, so that the animal can see in a very feeble light, and is thus adapted for nocturnal habits, to which it shows strong tendency.

The fur of the C. is very free from any oily substance, so as to be readily injured by water, and is capable of being rendered highly electric by friction, particularly in very dry or frosty weather. An electric spark is readily obtained from the tip of the ear.

The strong statements of Buffon gave for a time currency to the opinion that the C. is incapable of affection, and retains, even in a domesticated state, its ferocity, merely restrained by selfishness, and disguised by cunning. The belief is very prevalent that the C. forms an attachment to places only, and not to persons. There are, however, many well-authenticated instances in which the C. has shown a strong attachment to its master or mistress, though this quality is far less frequently and remarkably displayed than by the dog. The recorded instances of the C.'s attachment to places, are worthy of attention in connection with the subject of instinct in animals. Some of these instances of cats finding their way back from great distances to their former home are very wonderful, and indeed cannot be explained on any grounds or principles known. The same instinct and power, however, are displayed by some other animals.

The varieties of the domestic C. are neither numerous nor very different. The *Tortoise-shell C.* differs from the most common variety chiefly in color, though it is also particularly elegant and delicate in form. It is much more common in s. Europe than in Britain.—The *Angora C.* is a beautiful variety, remarkable for long silky hair.—The *Chinese C.* has a fine glossy fur, and is remarkable for pendulous ears.—The *Chartreuse* is of bluish color.—It is supposed that the *Tabby* may have undergone less change by domestication than any other variety.



Wild Cat.

The wild C. is still found in a few of the woods of the n. of England, in the mountains of Wales, the Highlands

of Scotland, and some parts of Ireland. It has entirely disappeared from districts where it was once common. It is the only beast of prey remaining in Britain the strength and fierceness of which make it at all dangerous to man; but an encounter with a wild C. is safe only to a man well armed. Fortunately, the instances of its attacking when unmolested are rare, but such instances have occurred. The wild C. is an inhabitant of deep thickets and recesses of woods, and of the rocky and bushy ravines of mountainous districts. Its fur, which is soft, long, and thick, is held in considerable estimation. The color of the face is yellowish-gray, with a band of black spots toward the muzzle; the forehead is brown; the head is gray, with two black stripes passing from the eyes, over and behind the ears; the back, sides, and limbs are gray, darker on the back, paler on the sides, with a blackish longitudinal stripe along the middle of the back, and numerous paler curved ones on the sides; the tail is ringed with light-gray and black, the tip being black. The length of a medium-sized male wild C. is almost two ft., exclusive of the tail, but this length is sometimes considerably exceeded.—We know no record of any attempt to domesticate the wild cat.

The animal often called wild C. in America is the bay lynx: see LYNX. See Mivart, *The Cat* (1881).

Superstitions regarding cats.—Cats have been objects of superstition from the earliest ages. In Egypt, they were held in highest reverence; temples were erected in their honor; sacrifices and devotions were offered to them; and it was customary for the family in whose house a C. died to shave their eyebrows. In the middle ages they were regarded as the familiars of witches. The favorite shape of Satan was said to be that of a black C., and the animal was an object of dread instead of veneration. There is or was a belief among sailors, that the frolics of a C. at sea portended a storm. Many people still prophesy rainy weather from a C. washing its face; and a cat-call on the house-top was formerly held to signify death. Their superstitious connection with witches, and the foolish belief that a C. has nine lives, have led to the perpetration of great cruelties upon them. See Brand's *Popular Antiquities*, Ellis's revised edition.

CAT, on Shipboard: name for many of the ropes or lines. CAT-FALL is a rope for heaving up the anchor from the water's level to the bow; it works through CAT-BLOCKS, and is connected with the CAT-HEAD. CAT-HARPINGS are small ropes for tightening the shrouds. CAT-HEADS, just named, are two strong, short timbers projecting from the bow, on each side of the bowsprit. CAT-HOOK is the fastening for the ring of the anchor to the cat-block. CAT-ROPE is a line for hauling the cat-hook about; the CAT-BACK-ROPE hauls the block to the ring of the anchor in order to hook it. CAT, v. to bring up to the cat-head. CAT-BEAM, or BEAKHEAD-BEAM is the broadest beam in the ship, generally made of two beams tabled and bolted together. CAT-HOLES in a ship are two little holes astern above the gun-room ports, through which the cable or hawser passes to

CAT—CATABROSA.

the capstan. CAT-RIG, a rig which in smooth water surpasses every other, but unsuited for sea or heavy weather.

CAT, or CAT-CASTLE, in the military engineering of the middle ages: a kind of movable tower to cover the sappers as they advanced to a besieged place. The garrison sometimes poured down burning pitch and boiling oil from the walls upon the C.; but occasionally this stratagem was disastrous, for the besiegers availed themselves of the blazing tower to burn the wooden gates of the town or fortress.

CATA, *kăt'ă* [Gr.]: a prefix signifying, down; against; opposition or contrariety; completeness; intensity.

CATABASION, n. *kat'a-bā'zhun* [Gr. *katabasion*—from *kata*, down, and *basis*, a going]: a chamber or crypt under a church, where relics are kept.

CATABROSA, *kăt-a-brō'sa* [Gr. *catabrōsis*, a gnaw^{ing}]:



Catabrosa aquatica:

a, panicle; *b*, part of stem, with roots and leaves; *c*, a spikelet; *d*, glumes.

genus of grasses formerly included in *Aira* (see HAIR-



Plan of the Catacomb of St. Agnes, Rome.



Catacomb.—A Gallery with Tombs,

GRASS), but distinguished by the leathery *paleæ*, which are ribbed, truncated, erose (as if gnawed at the points), awnless, and nearly equal. The glumes are much shorter than the spikelets, membranaceous, and very obtuse. The general appearance is different from that of the genus *Ara*.—*C. aquatica* is of wide geographic and climatic range, being found throughout Europe, from Lapland to the Mediterranean, and in the torrid regions of South America. It grows only in very moist situations, as the muddy margins of lakes and rivers, ditches, etc., and is cultivated only in irrigated meadows, or on the banks of rivers subject to overflow by high tides, where the ground is always wet and muddy. It is one of the most valuable grasses for such situations, its foliage being peculiarly sweet, and much relished by cattle. Both its foliage and its seeds afford much food to water-fowl, and to some kinds of fish, particularly carp. Its leaves often float, and its stalks seldom rise, more than a foot or fifteen inches above the surface of the water. It has a stiff branching panicle; with whorled spreading branches, and its seeds are small. When its artificial propagation is attempted, it is by dropping freshly gathered stems into still waters, or scattering them on the mud, more frequently than by sowing the seeds. It is called sometimes WHORL GRASS, sometimes SWEET WATER GRASS.

CATACAUSTICS, n. plu. *kăt'ă-kaws'tîks* [Gr. *kata*, against; *kaustîkos*, burning]: in *opt.*, the curves formed by the reflection of the rays of light. CAT'ACAUS'TIC, n. a particular curve formed by reflection: ADJ. pertaining to.

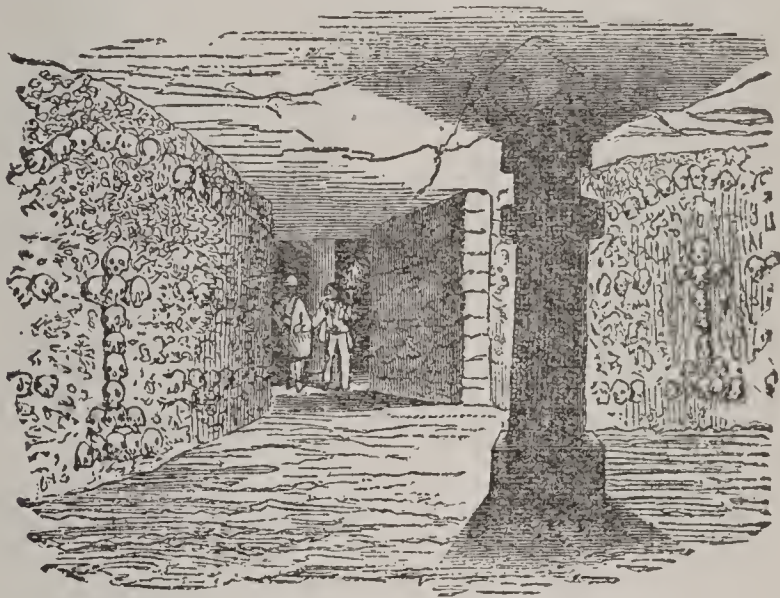
CATACHRESIS, n. *kăt'ă-krē'sîs* [Gr. *katachrēsis*, misuse, abuse]: in *rhet.*, an abuse of a trope or of words; the use of a word in a sense different from its own. CAT'ACHRES'TIC, a. *-krēs'tîk*, or CAT'ACHRES'TICAL, a. *-tî-kāl*, forced; far-fetched. CAT'ACHRES'TICALLY, ad. *-lî*.

CATACLYSM, n. *kăt'ă-klîzm* [Gr. *kataklus'mos*, inundation—from *kata*, down; *kluzein*, to wash]: any violent inundation that sweeps over a country. CAT'ACLYS'MAL, a. *-klîz'māl*, pertaining to an inundation or to its destructive effects. CAT'ACLYS'MIC, a. *-klîz'mîk*, of or pertaining to.

CATACOMB, n. *kăt'ă-kôm* [It. *catacomba*, a sepulchral vault—from Gr. *kata*, under, down; *kumbē*, a hollow or recess]: burial places in caves or hollow recesses under ground; divisions or niches in a cellar for storing liquors; specially applied to certain old subterranean sepulchres near Rome, in Egypt, etc. These subterraneous chambers and passages were formed generally in some rock, which is soft and easily excavated, such as *tufa*. Catacombs are to be found in almost every country in which such rocks exist, and, in most cases, probably originated in mere quarries, which afterward were used either as places of sepulture for the dead or as hiding places for the living. The most celebrated catacombs in existence, and those which are generally understood when catacombs are spoken of, are those on the Via Appia, a short distance from Rome. To these dreary crypts it is believed that the early Christ-

CATACOMB.

fians were in the habit of retiring, in order to celebrate their new worship, in times of persecution, and it is certain that in them were buried vast multitudes of the saints and martyrs of the primitive church; though historical students are now tending to doubt whether these mysterious and intricate caverns were very largely or for a long period used as places of abode for the living. They consist of long narrow galleries, usually about eight ft. high and five wide, which twist and turn in all directions, much resembling



Interior of one of the Catacombs of Paris.

mines; and at irregular intervals, expand into wide and lofty vaulted chambers. The galleries are often in stories one below another, and the innumerable turns and ascents and descents, and frequent interlacing of the passages, causes a labyrinth whose exploration outside of certain usual lines is attended with great danger. Some visitors have entered never to emerge again. The tombs were constructed by hollowing out a portion of the rock, at the side of the gallery, large enough to contain the body. The entrance was then built up with stones, on which usually the letters D. M. (*Deo Maximo*), or *xp.*, the first two letters of the Greek name of Christ, were inscribed. Other inscriptions and marks, such as the cross, are also found. The original extent of the catacombs is uncertain, the guides maintaining that they have a length of 20 m., whereas about six only can now be ascertained to exist, and of these many portions have either fallen in or become dangerous. When Rome was besieged by the Lombards in the 8th c., many of the catacombs were destroyed, and the popes afterward caused the remains of many of the saints and martyrs to be removed and buried in the churches. Art found its way into the catacombs at an early period, and many remains of frescoes are still found in them. After being neglected for centuries they were again brought to notice by Father Bosio, who spent 30 years in their exploration. His investigations were published 1632, two years after his death; but the most ex-

CATACOROLLA—CATALANI.

haustive treatise on the subject in all its aspects is the *Roma Sotterranea* of De' Rossi (1864-67, abridgment in English by Dr. Northcote).

The catacombs at Naples, cut into the Capo di Monte, resemble those at Rome, and evidently were used for the same purposes, being in many parts literally covered with Christian symbols. In one of the large vaulted chambers there are paintings, which have retained a freshness which is wonderful, considering the time and the dampness of the situation. The palm-tree, as a memorial of Judea, is a prominent object in these pictures. At Palermo and Syracuse are similar catacombs, the latter of considerable extent. They are found also in Greece, in Asia Minor, in Syria, Persia, and Egypt: see NECROPOLIS. At Milo, one of the Cyclades, there is a hill honey-combed with a labyrinth of tombs whose passages lead in every direction. In these bassi-rilievi and figures in *terra cotta* have been found, which prove them to be long anterior to the Christian era. In Peru and other parts of S. America, catacombs have been discovered. The catacombs in Paris are a kind of charnel-houses, into which the contents of such burying-places as were found to be pestilential, and the bodies of some of the victims of 1792, were cast.

CATACOROLLA, n. *kăt'ă-kō rōl'lä* [Gr. *kata*, under, down, and *corolla*]: in *bot*, a second corolla formed inside or outside the first one.

CATACoustICS, n. plu. *kăt'ă-kows'tiks* [Gr. *kata*, against, and *acoustics*]: the doctrine of reflected sounds or echoes.

CATAFALQUE, n. *kăt'ă-fălk* [F. *catafalque*—from It. *catafalco*, a funeral decoration: mid. L. *cadafal'tum*, a scaffold]: in funeral solemnities, a temporary wooden structure decorated with paintings, sculpture, drapery, etc., intended to represent a tomb, and show the coffin; an elaborate hearse. A magnificent C. was that used at the interment of Michel Angelo, at Florence.

CATALAN, *kăt'ă-lăn*: the language spoken in Catalonia and Valencia, in Spain; a kind of wine: ADJ. of or from Catalonia.

CATALANI, *kă-tă-lă'nē*, ANGEL'ICA: celebrated Italian singer: 1780 (or 84)–1849, June 13; b. Sinigaglia, in central Italy. She was educated in the convent of St. Lucien, near Rome, where, in her seventh year, she showed such wonderful vocal powers that strangers flocked from all quarters to hear her. She made her first public appearance at Venice, in her 16th year, and experienced a succession of triumphs in every country in Europe for more than 30 years, amassing immense sums of money. The Italian opera in Paris was twice under her direction; but her husband's interference and extravagance brought her into much trouble. Her large, queenly person and fine countenance, the immense volume, range, and flexibility of her voice, her power of sustaining her notes, in contrast with the lightness and facility of her unerring execution, everywhere took her audience by storm. Her expression,

CATALAUNIAN—CATALEPSY.

although fine, and her whole style, surprised rather than touched the heart. In concert-singing her great triumphs were in *Rhode's Air* with variations, and *God save the King*—in which she would say *shave*; and in oratories her special triumph was in *Luther's Hymn*, her delivery of which, when her marvellous voice alternated with the trumpet's sound, was so sublimely awful that the audience were hushed and pale, and some were borne away fainting. The throat from which these wondrous sounds proceeded was physically of such dimensions, that a physician, when called to look into it, declared he could have passed down a penny-loaf! In 1830, Madame C. purchased near Florence a villa, formerly belonging to the Medici family, where she gave free instructions to girls who had a talent for singing, on condition of their taking the name of Catalani. In the spring of 1849, when political disturbances broke out in Tuscany, she went with her daughters to Paris, where she died of cholera.

CATALAUNIAN PLAIN, *kăt-a-law'nĭ-an* (*Campi Catalaunici*): anc. name of the wide plain surrounding Châlons-sur-Marne, in the old province of Champagne, France, celebrated as the field of battle where the West Goths and the forces under the Roman general Aëtius gained a great victory over Attila, A.D. 451. A wild tradition (made the subject of a striking picture by Kaulbach, *Die Hunnenschlacht*, or *The Battle of the Huns*) tells that three days after the great fight the ghosts of the fallen myriads appeared on the plain and renewed the conflict.

CATAL'DO, SAN: town of Sicily, province of Caltanissetta; five m. w. of the town of Caltanissetta. There are productive sulphur mines in its vicinity. Pop. (1881) 15,000.

CATALECTIC, a. *kăt'ă lĕk'tĭk* [Gr. *katalek'tikos*, incomplete]: ending suddenly, as a verse wanting a syllable.

CATALEPSY, n. *kăt'ă-lĕp'sĭ* [Gr. *katalēpsis*—from *kata*, down; *lepsis*, a taking or seizing]: a disease in which there is more or less complete insensibility, with absence of the power of voluntary motion, and statue-like fixedness of the body and limbs in the attitude immediately preceding the attack, a like position being retained, also, unless altered by force, until the return of consciousness; sometimes merely the state known as *trance* (q.v.). **CAT'ALEP'TIC**, a. *-tĭk*, pertaining to. In catalepsy the patient is usually in good health at the time of seizure, or subject only to nervous affections, such as hysteria (q.v.); sometimes the attack is preceded by disappointment, fear, violent, exciting, or depressing passions, or even religious emotions, being in such cases only an extreme form of what is otherwise called *trance*, *reverie*, or *ecstasy* (q.v.); on other occasions the apparent cause is more purely physical, as in some of the hysterical cases depending on suppressed menstruation. In all cases of cataleptic rigidity and insensibility it may be presumed that the brain, as the organ of consciousness, is disturbed; but it does not appear that in any considerable proportion there is structural disease. Patients rarely die during the attack, which may, however, be protracted

CATALOGUE—CATALONIA.

for an indefinite period, and may even endanger life directly by the debility consequent on imperfect nourishment. The circulation and respiration are, in most instances, little affected; cases, however, have been recorded in which, in consequence of their failure, the patient has been supposed to be dead: see DEATH. Many of the recorded cases of C. are little worthy of credit, and it has even been doubted whether this curious disease can ever be said to exist exempt from some degree of deception, or at least voluntary and conscious regulation of the muscles on the part of the person affected. The combination of C. with hysteria, and its frequent association with what are called the higher phenomena of mesmerism (see HYPNOTISM), undoubtedly occasion great suspicion; but it would certainly be wrong to suppose that all the cases described were fictitious, and not less wrong to classify them all under the head of pure imposture. Epidemic C. has been described, and in such cases it appears plain that the principle of imitation, so powerful in producing nervous disease, must have been at work. The remedies of C. are the same as those of the states to which it is so nearly allied, and of which it may be said to form a part. Moral means form a large part of the treatment, as in hysteria. In some cases, it may become necessary to administer food by means of the stomach-pump, and this even for weeks or months. Such a case has been known to end in complete recovery.

CATALOGUE, n. *kăt'ă-lŏg* [F. *catalogue*—from Gr. *kătal'ŏgos*, a list—from *kata*, down; *logos*, a word]: a list of names in regular order; a roll; a register (see BIBLIOGRAPHY: BRITISH MUSEUM: LIBRARY: STARS): V. to make a list of. CAT'ALOGUING, imp. CAT'ALOGUED, pp. -lŏgd.

—CATALONIA, *kăt-a-lŏ'nĭ-a* (Spanish, *Cataluña*): old province and principality of Spain, now divided into the provinces of Barcelona, Tarragona, Lerida, and Gerona; total area 12,483 sq. m.; pop. (1900) 1,946,382. C. occupies the n.e. corner of Spain, having France on the n., and the Mediterranean on the e. and s.e. It is watered by the Llobregat, and the Ter, and by some of the affluents of the Ebro, the last mentioned river having its embouchure in Catalonia. The coast is rugged, its boldest promontories being Capes Creus and San Sebastian, and its deepest indentations the bays of Rosas and Tarragona. With the exception of a few low plains of limited extent, the soil of C. is that of a wild mountainous region formed by numerous offsets or terraces of the Pyrenees, one great ridge or series of ridges extending through the centre of the province.

The terraces, sloping abruptly down to the coast, or to the narrow coast plains, are divided by the valley of Llobregat into the lower and the upper Catalonian mountains.

The climate of C., though fog and rain are frequent, and extreme and rapid changes of temperature prevail, is on the whole healthful, and favorable to vegetation. Near Barcelona, oranges flourish in the open air; the fields in some parts are bounded by aloe-hedges, and olives grow on Montserrat. Cork-trees grow on the mountains, and thickets of thorn-apple, laurel, myrtle, pomegranate, box, rosemary,

CATALPA.

etc., extend where the cork has its limits. Northern upper C. has a more severe winter than the south; but everywhere, vineyards and olive-gardens cover the slopes, and cornfields extend in the valleys. Among the products are hemp, flax, madder, barilla, and saffron. Hazel-nuts, a variety called Barcelona nuts, are extensively grown. Meadow-lands and pastures are comparatively rare, and horned cattle are, therefore, found mostly in the districts bordering the Pyrenees; while few horses and mules are kept; but sheep, goats, and swine are bred in considerable numbers. Silk-worms and bees are reared. The coasts abound with fish, and game is plentiful. The minerals are coal, copper, manganese, zinc, lead, cobalt, salt, sulphur, and many varieties of marble.

C. is the principal manufacturing province of the kingdom—is, in fact, 'the Lancashire of Spain.' The inhabitants are neither French nor Spaniards, their language, costume, and habits being quite distinct from those of either; they have also local coins, weights, and measures. In energy, industry, and intelligence, they greatly surpass the rest of the Spaniards.

C., under the name of *Hispania Tarraconensis*, was one of the earliest, and remained among the last of the Roman provinces. It was invaded and captured by the Alans, who were followed by the Goths; hence its name, *Gothallania*, changed into Gothallunia or Catalonia. In the 8th c. the Arabs gained possession of the s. part. When Charlemagne, 788, subjugated Spain as far as the Ebro, C. formed the central portion of the Spanish mark, governed by French counts, having Barcelona as their residence. They soon made themselves independent of France. In 1137, Earl Raymund Berengar, by his marriage, united C. with Aragon; and the marriage of Ferdinand and Isabella (1469) united both with Castile, and so C. became a portion of the Spanish monarchy, but never a very peaceable one. In modern times it has repeatedly taken a prominent share in Carlist or other insurrections.

CATALPA, *ka-tāl'pā*: genus of trees of the order *Bignoniaceæ*, with a two-parted calyx, a bell-shaped corolla and five stamens, two of which bear a cylindrical pod often one ft. long, and broadly-winged seeds. There are three species: the chief, *C. syringifolia*, is indigenous in the southern states, where it is often over 50 ft. high, with a trunk two ft. in diameter. It has a silver-gray bark, few branches, a wide-spreading head, and large, heart-shaped, pale green leaves; the flowers are white, dotted with purple and violet; the pods remain on the tree through the winter. The C. is much cultivated in the northern states and in Europe. In New England it dwindles to a shrub, and is often killed by frost. In milder climates it will grow to a height of 20 ft. in ten years, and then begin to blossom. One in Gray's Inn gardens, London, is said to have been planted by Bacon. In Italy and southern France it is often planted along the roadside. The C. may be propagated by seeds, or from cuttings of the root. Its wood being light, of fine texture, and susceptible of a brilliant polish, is used by cabinet-makers.

CATALYSIS—CATAMARAN.

CATALYSIS, n. *kă-tăl'î-sîs* [Gr. *katâl'ûsis*—from *kata*, down; *lûō*, I loosen]: in *chem. physics*, term used to designate certain phenomena, in which changes in the composition of substances are effected by the presence of another body which itself undergoes no change. **CATALYTIC**, a. *kăt'ă-lî't'îk*, relating to catalysis. The force in catalysis has been ascribed to the mere 'action of contact.' Fermentation is an example of this force (see **BEER**), when one part of yeast acting upon the sugar of the sweet worts, without entering into combination with it, compels 100 parts of sugar to pass into alcohol and carbonic acid. Germination, or the sprouting of grain when placed in the ground, is another example where one part of *diastase* changes 1,000 parts of starch into sugar. No plausible theory has been brought forward to account for these changes, or to define what the force of C. is. Liebig suggested, as an explanation, 'that a body in the act of combination or decomposition enables another body with which it is in contact to enter into the same state;' but this view does not explain C., as that force does not act in the majority of cases where changes are proceeding, and, moreover, the acting substance, while changing itself, never throws the body acted upon into the *same state of change*, but causes it to assume a new series of changes different from those pursued by itself.

CATALYSOTYPE, *kăt-a-lîs'ō-tîp*: a name given to a modification (by Dr. Wood) of the calotype process, in photography, on the assumption that light set up a catalytic action (see **CATALYSIS**) among the ingredients employed. The paper is first washed with very dilute hydrochloric acid, to prevent the formation of yellow patches of insensitiveness, and then treated with sirup of iodide of iron containing a trace of free iodine; it is then partially dried between folds of blotting-paper, and sensitized by brushing over it a solution of nitrate of silver of ten grains to the ounce. Immediate exposure in the camera follows; after which, though no picture be visible at first, if it be allowed to remain in the dark for a period which varies with the length of time it was exposed, and the amount of light, a negative picture of great perfection is gradually developed. It is not necessary, however, for the explanation of this phenomenon, to assume that a catalytic action is set up, inasmuch as the ordinary chemical reactions are quite sufficient to account for it. As soon as *nitrate of silver* comes in contact with the moist *iodide of iron* with which the paper is first imbued, an interchange of elements takes place, *iodide of silver* is precipitated in the pores of the paper, and *protonitrate of iron* is diffused over the surface; and this latter salt is even a more energetic developing agent than the ordinary gallic acid, hence the seemingly spontaneous appearance of the picture. This process is so uncertain in its results that it is seldom practiced.

CATAMARAN, n. *kăt'ă-mă-răn'* [*cathamaran*, floating trees—native name]: raft formed of three planks or logs lashed together, the middle one serving as a keel, and the other two for the sides. The rower stands or partly kneels

CATAMARCA—CATAMENIA.

on the middle plank, and works a paddle. These simple vessels are used by the natives of Madras, to maintain communication between ships and the shore, ordinary boats being rendered unsafe by the surf. By the adoption of a similar construction on a larger scale, some



Indian Catamaran.

catamarans are made large and strong enough to carry goods, and even artillery. Catamarans used in Brazil consist simply of three logs of wood tapered at the end and lashed together; they carry a sail.

CATAMARCA, *kâ-tâ-mâr'kâ*: province of the Argentine republic, lat. 25° – 29° s., lon. 65° – 69° w.; bounded n. by Salta, e. by Tucuman and Santiago, s. by Rioja, and w. by the Andes; 31,500 sq. m. It is largely mountainous; the highest range, Sierra de Aconquija, is nearly 17,000 ft. high. The streams are mostly dry in summer and torrents in winter; the only river is the Santa Maria. Some of the elevated plains are sandy deserts; others are yearly inundated, and on the withdrawal of the waters covered with blocks of salt, which are carried away on llamas and sold. Gold and silver mines were formerly worked, and copper is still found in quantities. Parts of C are fertile and produce abundantly grain, vegetables, and fruit, especially apples. Cotton, though said to be the finest known, is raised on a smaller scale than formerly. The forests yield many varieties of timber. Earthenware, ponchos, and woolen and alpaca fabrics are manufactured; cattle, mules, asses, sheep, hides, leather, wine, brandy, tobacco, pepper, cochineal, anise-seed, and copper are exported. Pop. (1895) 89,645, abt. one-half Mestizos and Indians of the once powerful Calchaquio tribe. Immigration from Europe has been active since 1875.

CATAMARCA (originally *San Fernando de C*): capital of province of C.; lat. 28° $20'$ s., long. 66° $25'$ w. It was built 1685 to replace the former cap. Chacca, the site of which, not far w., had been found unhealthful and exposed to inundation. C. is built with some regularity, has a large square, an obelisk commemorating national independence, a small town house, a fort, a Franciscan monastery, and a St. Theresa convent: another, formerly used by the Mercedarios and the Jesuits, is now a high school. C. is the commercial centre of a large and well-cultivated dist. It manufactures flour and hats, and exports dried figs, wine, brandy, and cotton. Pop. 8,000.

CATAMENIA, n. *kăt'ă-mě'nĭ-ă* [Gr. *katamēniōs*, month-

CATANDUANES—CATANIA.

ly—from *kata*, down. *men*, month]: the monthly courses of females (see MENSTRUATION). CAT'AME'NIAL, a. -*me'-ni-al*, pertaining to.

CATANDUANES, a small island in the Philippines, e. of Luzon, about 90 m. long by 50 m. wide; area 704 sq. m. It is mountainous, and is reputed to have rich gold deposits. In 1900 the island with Leyte and part of Luzon was created a military department, over which Gen. John C. Bates was placed in command. There are no large towns in Catanduanes. Pop. (1899) 35,633.

CATANIA, *kā-tā' nē-ā*, or CATANEA, *kā-tā'nā-ā*: province of Sicily (q.v.) on the e. coast; the most fertile and one of the richest provinces of the island; 1,970 sq. m. Part of it near the coast consists of a great plain, from which rises Mt. Etna. Pop. (1881) 563,217; (1901) 705,412.

CATANIA, *kā-tā'nē-ā*, or CATANEA, *kā-tā'nā-ā*: city and seaport of Sicily, cap. of the province of C.; on the e. coast near the foot of Mt. Etna, 31 m. n.n.w. of Syracuse. The fertile and well-cultivated neighborhood of C., along the s.e. base of Mt. Etna, is styled 'the granary of Sicily,' and has given to C. the title, 'La Bella Catania.' By eruptions of the great volcano and attendant earthquakes, the city has been several times almost entirely destroyed—especially in 1693; but out of its ruins it has always risen with increased beauty, and is now the finest city in Sicily, being built throughout on a beautiful and consistent plan, from which no deviation is allowed. The harbor of C., formerly good, was choked by a stream of lava in 1693, and the mole was partly destroyed, so that now it has only a roadstead, which is guarded by a fort, and serves as a landing-place. It has several squares, the finest of which, in front of the cathedral, has a statue of an elephant sculptured in lava. Among its chief public buildings are the Benedictine convent and church of San Nicolo, with one exception the grandest structure of the kind in Europe; the town-hall, the cathedral, with its noble granite columns, and the university, founded 1445. It has besides many handsome churches and convents, and several educational and charitable institutions, and is the seat of one of the three high courts in the island. The inhabitants are distinguished by their commercial spirit and industry. C. has manufactures of silk and linen goods, and of articles in amber, lava, wood, etc. Among the remains of ancient times, that earthquakes have spared, are those of a theatre, an odeium, a temple of Ceres, Roman baths, and an aqueduct. C., anciently known by the name *Catana*, was founded by a Greek colony of Chalcidic origin in the latter part of B.C. 8th c.; and as early as the beginning of B.C. 5th c. it was esteemed one of the most flourishing towns in Sicily. It was taken by the Athenians under Nicias and was desolated by Dionysius I.; but again rose under the Roman sway into its former importance. Augustus here founded a Roman colony. It suffered at the hands of the Goths, but once

CATANIA—CATAPLASM.

more, under the Byzantine empire, became one of the principal cities in the island. Pop., formerly much more numerous, (1881) 97,355; (1901) 149,295.

CATANIA, GULF OF: inlet of the Mediterranean, on the e. coast of Sicily, extending in the form of a semicircle from La Trezza Bay to Cape Santa Croce, 18 m. It extends about 10 m. within the coast line, and receives the river Giaretta.

CATANZARO, *ká-tán-zá'rō*: city of s. Italy, province of C. beautifully situated on the declivity of a rocky hill, near the Gulf of Squillace, and in a very fertile district. On account of its agreeable climate, many wealthy families have made it their residence. It has a cathedral, an old castle of the Norman period, a college, one of the largest, as it is one of the best conducted in the country, and is the seat of one of the four great civil courts of the kingdom. C. suffered very severely by an earthquake 1783. It has manufactures of silk-velvet and woolen fabrics, and an active trade in agricultural produce. Pop. (1881) 20,931; (1901) 31,824.

CATAPETALOUS, a. *kăt'ă-pět'ă-lūs* [Gr. *kata*, under; *petalon*, a petal]: in *bot.*, having the petals joined to each other and to the stamens, at the base, as in mallows.

CATAPHRACT, n. *kăt'ă-frăkt* [Gr. *kataphrak'tos*, encased, fortified]: defensive armor; a horseman in complete armor. **CAT'APHRAC'TED**, a. *-frăk'tēd*, covered with armor or scales.

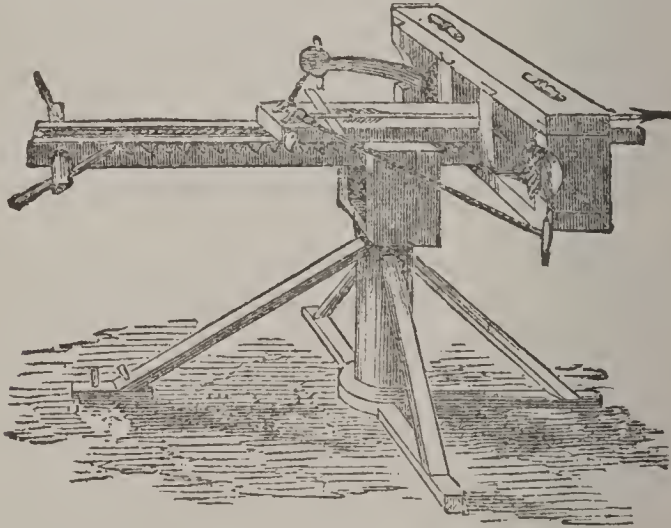
CATAPHYLLARY, a. *kăt'ă-fĭl'ēr-ĭ* [Gr. *kata*, down; *phyllon*, a leaf]: applied to the leaves of a plant when they are mere scales; having the leaves inclosed in buds by perules, or on a root-stock by scales; inclosing true leaves.

CATAPLASM, n. *kăt'ă-plăzm* [L. *cataplas'ma*; Gr. *kata-plas'ma*—from Gr. *kata*, down; *plasso*, I mold: F. *cataplasme*]: poultice or plaster; an application to diseased or painful parts. for the purpose of promoting suppuration, relieving pain, and stimulating or soothing the skin, according to circumstances. A C. may be composed of any moist pulpy substance of sufficient consistence to retain the water without dripping or soaking through the thin muslin covering in which it is generally wrapped. The making of a poultice is a matter of some nicety, and unless the proper consistence is given to the mass, the application is apt to do more harm than good. The linseed-meal poultice is the most easily made, and most satisfactory of all soothing applications. The meal is stirred gradually into a sufficient quantity of boiling water, placed in the bottom of a small basin or teacup, until a perfectly smooth pulp is formed of the proper consistence, and in quantity sufficient to cover completely, to the thickness of three-quarters of an inch, the whole pained part. The pulp is then folded up in muslin or thin calico, and applied as soon as the heat will permit it to be borne. The bread and milk, or even bread and water poultice, is also very good; as is also the oatmeal-porridge poultice, to which a little butter may be added with advantage. A spoonful or two of yeast may be added, if there

CATAPULT--CATARACT.

are foul discharges, or peat charcoal may be sprinkled on the surface of the poultice before it is applied. Carrot poultices are in great favor with the people in some places. Hemlock poultices, made of the fresh leaves, or of the dried leaves, with the aid of some powder of the leaves, form a valuable sedative application in painful diseases; and poppy-heads, or even opium, are sometimes infused in the water of which a poultice is made, for the same purpose. A stimulating C. or poultice may be made by sprinkling oil of turpentine, or chloroform, or mustard in moderate quantity on the surface of any ordinary poultice. When considerable irritation of the skin in a short time is desirable, a mustard C. or sinapism [*sinapi*, mustard] is used.

CATAPULT, n. *kăt'ă-pălt* [L. *catapul'ta*—from Gr. *kata*, down; *pallo*, I hurl: comp. Gael. *cathtabhail*, the battle-sling]: engine of war used by the ancients, somewhat resembling the crossbow. In the C. a string or rope, suddenly freed from great tension, gave a powerful impulse to an arrow placed in a groove. There were also great catapults, fixed upon a scaffold with wheels, which were used for



Catapult.

throwing great stones in sieges; and small ones, carried in the hand, which were employed in the field. For a description of similar engines of ancient warfare, see BALLISTA: ARBALEST. A toy-C. is used by boys in their amusements to throw stones.

CATARACT, n. *kăt'ă-răkt* [Gr. *katărăktēs*; L. *catarac'ta*, a waterfall—from Gr. *kata*, down; *raktos*, a precipice, or *rhasso*, I dash]: the rushing of a great body of water over steep rocks (see WATERFALL); a disease in the eye by which the vision becomes impaired or destroyed, caused by an opacity of the cornea.

CATARACT, *kăt'a-răkt*: opaque condition of the lens of the eye. It is readily distinguished from opacities of the cornea, or clear front part of the eye, by its position just behind the pupil—that round and varying aperture in the iris through which light is admitted into the back of the eye. C. may affect the lens alone (lenticular C.), or the front or back of the capsule of the lens (capsular C.), or both lens and

CATARACT.

capsule (capsulo lenticular C.). Its whiteness varies from that of half-boiled white of egg to that of snow. Heat will produce a like change on the lens out of the body, just as it changes white of egg from transparent to opaque. The rounded lens of the fish is seen at table in this opaque condition.

C. is painless and unaccompanied by inflammation. It occasions blindness simply by obstructing the passage of the light; but C. alone does not produce so complete blindness but that the patient can tell light from darkness. It may occur at any age, but is most common in elderly persons, and is not unfrequent in children, who may even be born with it. The catoptric test, as it is called, is an ingenious method of distinguishing incipient C. from certain other deep affections of the eye. When a lighted candle is held before the eye of a person whose back is to the window, three candles are seen in the healthy eye. Two are erect—the large front one caused by the convex cornea, the smaller and fainter one behind by the convex front of the lens. The third, occasioned by the concave back of the lens, is in the middle; is small, bright, and turned upside down; and, when the candle is moved, goes in the opposite direction, while the two erect images move in the same direction with the candle. When the back of the lens becomes opaque the inverted image is obscured or disappears; and when the front of the lens is affected only the great front image, caused by the cornea, remains. This curious experiment may be tried on a large scale, by holding a common bi-convex lens a little way behind a watch-glass. Then, on greasing the back of the lens, to imitate C., the inverted image disappears, and, on turning the lens round, all but the image in the watch-glass disappears.

No medical or other treatment has any influence in arresting the progress of C., nor can it be cured otherwise than by a surgical operation. A clever imposture used to be practiced by quacks. By applying belladonna to the eye—as the surgeon does when he wishes to dilate the pupil for an examination or operation—some little light was temporarily admitted through the less opaque edge of the lens. The patient beginning to see somewhat better, after long and increasing dimness of vision, began to congratulate himself on a cure; the quack, of course, hastened to get his money without waiting for the further result, which was sure to be blank disappointment. So long as there is fair vision with one eye, the operation on the other may be delayed. It is a mistake to delay the operation in children on account of their tender age. The sooner it is done the better, both for the eye and the education of the child.

Three methods of operation are practiced. 1. For *absorption* or solution. This is suitable for children, in whom the C., like the natural lens, is soft, and in all other cases in which there is reason to suppose that the C. is soft. An appropriate needle is passed through the cornea; made to open and lacerate the front of the capsule, the rags of which curl out of the way behind the iris, so that

their subsequent opacity does not obstruct the light; then the soft cataractous lens is punctured and picked so as more effectually to admit the aqueous humor, which naturally fills the space between the lens and the cornea, and which has the remarkable property of absorbing or dissolving the lens or cataract when admitted within the capsule. This operation may require to be repeated several times, at intervals of a few weeks, before the whole C. is dissolved. 2. *Displacement*. A needle is passed through the fore part of the white of the eye, until it is seen through the upper part of the pupil, lying across the front of the upper part of the lens. This is now pressed back, so as to make the lens sink down and back into the vitreous humor, when it is either slowly absorbed, or may in part permanently remain. The older method of displacement, termed couching, in which the lens was pushed more directly downward, is now abandoned, as more likely to press on the retina and cause subsequent evil to the eye. 3. *Extraction*. Half the cornea, through nearly its whole breadth, is divided with Beer's knife, an operation requiring great skill; the front of the capsule is opened, and disposed of with a needle; and the lens is gently assisted out of its place, through the pupil, and out of the opening in the cornea, great care being taken not to allow the vitreous humor to follow. Displacement and extraction are both applicable to hard cataracts, the form it generally takes in old age, as the lens itself becomes naturally harder with age, as well as more flat and amber-tinted. Displacement is more likely to be followed by bad consequences, some time after, from the presence of the displaced lens, while the risk of extraction is greater at the operation. The surgeon must decide which is best for each case. Though not so simple and successful as the operation for absorption through the cornea for soft C., displacement and extraction are generally very successful in restoring vision. The place of the lens is supplied by fluid humor, the refracting power of which is nearly equal to that of the lens, and the restoration of vision may be perfect. All of these operations require minute anatomical knowledge (see EYE) and great nicety and skill in the use of the instruments.

CATARHINA, *kăt'ă-rî'nă* [Gr. *kata*, down; *rhînēs*, nostrils]: in *zool.*, a group of the *Quadrumanæ*, characterized by twisted or curved nostrils placed at the end of the snout (see MONKEY). CATARRHINE, a. *kăt'ăr-în*, of or belonging to.

CATARRH, n. *kă-tăr'* [L. *catarrhus*—from Gr. *kata*, down; *rhêō*, I flow]: a disease of great frequency in temperate latitudes, especially in changeable, moist climates in the winter, or in the late autumn and early spring. CATARRHAL, a. *-răl*, pertaining to. From the well-known connection of this disease with sudden falls of temperature, and other epidemic or atmospheric causes (see INFLUENZA), as also from the chill often experienced at the commencement of the disease, it is popularly called *a cold*—a term quite inappropriate in many cases; while the

CATARRH.

term C. is in popular use restricted to a 'cold' attended with discharge of mucus by sneezing or coughing. A 'cold in the head' is, in scientific language, *Coryza*. Catarrh (or 'cold') commonly begins with a feeling of chilliness, which may or may not be attributable to external causes. Sometimes this is absent, there being only a sense of languor and indisposition; not unfrequently there is no unusual sensation until a stuffing is experienced in the nostrils, or severe headache, or hoarseness with cough, or oppression of the breathing. The regular form of a cold is to attack the nostrils first—in some cases the throat, and afterward the air-passages leading to the chest. When it habitually attacks the chest, without running through its ordinary course as indicated above, there is often some special cause of delicacy in the lungs, or some constitutional tendency toward consumption (q.v.). The discharge is in the beginning watery, becoming afterward more abundant, glairy, and of yellowish color; the early stages of the disease are attended by considerable irritation of the surfaces affected, and there is frequently a general feeling of prostration. The tendency of C. to attack the chest, and thus to pass into Bronchitis or Pneumonia (q.v.), or to lay the foundation of tubercular disease, constitutes almost its only danger. See CHEST.

The treatment of a catarrh (or 'cold') is commonly simple, so far as the particular attack is concerned. Confinement to the house, and, in severe cases, to bed, or to the sofa, for a day or two; a warm hip or foot bath, to remove the chill; light farinaceous diet, and, if the stomach and bowels are at all loaded, a dose or two of some gentle laxative, are usually sufficient to subdue the disease. Some persons gain a cure by entire abstinence from food, and as much as possible from drink; others by a large opiate, or by a succession of doses of Dover's powder; others by spirit of mindererus and paragoric; some even profess to carry out the popular maxim, 'stuff a cold, and starve a fever,' and maintain, that a good dinner, and a tumbler of whisky or brandy toddy, are the best specifics. That persons recover from C. under all these methods, needs not be denied; but that any violently perturbative or specific practice assists the cure, or shortens the disease, has yet to be proved; and multiplied experience has shown, that 'stuffing a cold' is by no means to be commended. In the later stages, however, a more liberal diet than at first, and in some cases even a very cautious allowance of stimulants, afford considerable relief from the feeling of depression that remains for a time on the subsidence of a catarrh. The tendency to this disease, when habitual, and when not dependent on any form of constitutional disorder requiring special means for its cure, is best met by the daily use of the cold bath, with frequent exercise in the open air, and proper ventilation of the sleeping-apartment; also by friction of the skin, and by clothing, which, without being oppressive, is comfortably warm. Exposure to draughts or sudden chills, when the surface is perspiring, is to be avoided; but even without such ex-

posure, a close confined or over-heated air habitually breathed in a workshop or bedroom, is, though often deemed unimportant, one of the most fruitful predisposing causes of the disease.

CATASETUM, n. *kăt'ă-sē'tŭm* [perhaps Gr. *kata*, down, against; L. *sēta*, a stiff hair, a bristle, a spiny leaf]: an extensive genus of fleshy-stemmed, terrestrial orchids of tropical America, ord. *Orchidicēæ*—probably so named from the extraordinary crests and projections on the labellum.

CATASTASIS, n. *ka-tās'tă-sīs* [Gr. *katastasis*—from *kata*, down; *histēmi*, to set]: in *rhet.*, the exordium of a speech; that part in which the speaker sets forth the subject-matter to be discussed, and the order and manner in which it is proposed to be treated; in *med.*, the state or condition of a person; constitution.

CATASTROPHE, n. *kă-tās'trō-fě* [Gr. *katăstrophē*, an overthrow—from *kata*, down; *strophē*, a turning]: a great calamity; a violent convulsion in nature; a final event; the conclusion of a series of events. CATASTROPHISM, *ka-tās'trō-fĭzm*, theory in *geol.*, that violent convulsions or physical revolutions have occurred at successive periods, causing the elevation or subsidence of portions of the globe, and the destruction of large tribes of men or multitudes of animals.

CATAWBA, *ka-taw'ba*, or GREAT CATAWBA: river of North and South Carolina. It rises in McDowell co., N. C., in the Blue Ridge, flows e. through the gold region to Iredell co., turns s. into S. C., and forms the e. boundary of York co., and Chester co.; near Rocky Mount it receives an affluent and changes its name to the Wateree, which with the Congaree forms the Santee. The C. is abt. 250 m. long; the Wateree 100 miles.

CATAWBA: a light sparkling wine, of rich Muscadine flavor, produced in the neighborhood of Cincinnati. It is made from a grape called the C. grape, 'first found growing on the banks of the Catawba river, in Carolina. This wine, scarcely known in England, is now in extensive use in N. America, where it is gradually superseding the importation of the Rhenish and French sparkling wines, which, in general character, it resembles. The vineyards where the C. is produced are on the steep and beautiful slopes with southern exposure on the banks of the Ohio river, under the shelter of high hills on the n. The first great grower of the C. was Nicholas Longworth, an early settler and esteemed and wealthy proprietor in this region, who, embarking in the pursuit less on business considerations than as an enthusiast, succeeded, after patient care and much expense, in producing a wine that in many parts of the United States finds a favor and a price rivalling the choice imported wines. Some of the finer kinds of C. equal the best champagne in delicacy and purity, but there are numerous inferior American imitations.

CATAWBAS, *ka-taw'baz*: Indian tribe in North and South Carolina, now nearly extinct. In the last c. they occupied six towns on the Catawba river, had 1,500 war

CATBALOGAN—CATCH.

riors, fought with the Cherokees, Shawnees, and Iroquois, but were friendly to the whites, helped them against other tribes, and furnished S. C. with troops in the revolutionary war; afterward they leased their lands and removed to the Cherokee country, but returned to a reservation granted them. Peter Harris, a soldier of the revolution, was said to be the last C. of pure blood; those now remaining are half-breeds. Gallatin grouped the C.'s with the Cherokees, Choctaws, Muskogees, and Natchez. Their language is allied to that of the Waccos, but not to those of Canada whence they were said to have come. 300 of their words, collected by O. M. Lieber, 1856, appeared in vol. ii. of the *Collections of S. Car. Hist. Soc.*, 1858.

CATBALOGAN, *kât-bâ-lō-gân'*, or CADVALONGA, *kâd-vâ-lōn'gâ*: town of the Philippines, cap. of the island of Samar, on a small bay on the w. coast. The houses are mostly constructed of nipa palm, but there are some of stone. Pop. abt. 7,000.

CAT-BIRD (*Turdus felivox*): an American thrush, of the same group with the mocking-bird, which it resembles in vocal powers. It is a bird of passage, making its way northward in spring through Georgia and Carolina as far as Massachusetts. It feeds on fruit and berries of all kinds, worms, and insects; builds a large nest of dry twigs, weeds, etc., without any attempt at concealment, in a bush or tree, often in the immediate vicinity of human habitations, and shows extraordinary boldness in the defense of its young. It has its name from a mewling cry which it utters when annoyed by an intruder approaching too near its nest.

CATCH, v. *kăch* [F. *chasser*; prov. F. *cacher*, to hunt—from mid. L. *captîrē*, to hunt: Ger. *klatsch*, a slap, a clap: Gael. *glac*, to seize]: to seize; to seize suddenly in hunting; to lay hold on with the hands; to arrest; to snatch; to take or receive by exposure, as a cold, or a disease by infection; to take hold, as fire; to insnare; to overtake: N. anything that seizes or holds; the thing caught; a latch; the act of seizing; a sudden advantage taken; a song in parts, in which those singing catch up the strain one after the other at various intervals; a musical composition in the canon style, which originated in England. The words, generally humorous, are intended to be sung in musical parties; and the music is generally for three voices, each voice, as in the canon, taking up the subject at a certain distance after the first has begun. CATCH'ING, imp.: ADJ. apt to catch; infectious. CAUGHT, pp. pt. *knwt*. CATCH'ER, n. one who. CATCH-PENNY, something worthless: a book published for the public taste, but without value. CATCH-WORD, the word placed under the last line of a page, and made to begin the first line of the next. CATCHING A TARTAR, being caught in the trap one has laid for another; being deceived in the character of the object which has been pursued. CATCHMENT, n. *kăch'měnt*, in *engin*, a space of ground where water may be caught and retained for use. CATCH-DRAINS, or CATCHING-DRAINS, open or covered drains

across a declivity to intercept and lead off surface-water. CATCHMENT BASIN or AREA, the whole area by the drainage of which a river is fed; an area or basin of water receiving running streams, but which itself has no outlet to the sea or ocean. To CATCH THE MEANING, to understand the sense or import. To CATCH THE EYE, to arrest the attention of one who is looking. To CATCH UP, to interrupt; to answer suddenly.—SYN. of 'catch, v.': to seize; snatch; grasp; gripe; fasten upon; charm; please; communicate.

CATCH-FLY, n. *käch-flī* [*catch*, and *fly*]: common English name of several elegant flowering plants of the nat. ord. *Caryophyllaceæ*—as *Silene Armeria*, *S. Anglica*, *Lychnis Viscaria*, etc.—which being clammy, in consequence of a peculiar exudation, on the calyx, on the joints of the stem, etc., often prove fatal to insects settling upon them: see LYCHNIS and SILENE. The name is sometimes employed by botanists as a sort of popular equivalent to *Silene*.—*Dionæa muscipula* is sometimes called the Carolina Catch-fly: see DIONÆA.

CATCH-POLL, or CATCH-POLE, n. *käch'pōl* [*catch*, and *poll*, the head: OF. *chacepol*, an officer of taxes—from mid. L. *cachepo'lus*, a collector of taxes]: in *England*, a sheriff's officer, or bailiff; a sergeant; one employed to apprehend a person; so called, it is said, because of the custom of catching the victim by the *poll* or head.

CATCHUP, n. *käch'ŭp*, or CATSUP, n. *käts'ŭp* [of E. I. origin]: a sauce made from mushrooms; ketchup.

CATEAU, LE, *lēh kâ-tō'*, or CATEAU-CAMBRESIS, *kâ-tō'-kōng-brā-zē'* or *kōng-brā-sē'*: town of France, dept. of Nord; on the Selle, 14 m. e.s.e. of Cambrai. C. has manufactures of shawls, merinoes, calicoes, and leather; it has also breweries and distilleries. It is noted as the place where, in 1559, the treaty known as that of Cateau-Cambrésis was concluded between Henri II. of France and Philip II. of Spain, by which the former monarch ceded to the latter, Savoy, Corsica, and nearly 200 forts in Italy and the Low Countries. Pop. (1886) 9,686; (1896) 10,451.

CATECHISE, v. *kăt'ĕ-kīz* [mid. L. *catechizārē*, to catechise—from Gr. *katēchi'zein*, to instruct; *katēchēsis*, instruction by word of mouth, instruction in the elements of a science—from *kata*, down; *echos*, a sound, hence a resounding]: to instruct or examine by asking questions and receiving answers; to interrogate; to try by asking questions. CAT'ECHISING, imp.: N. the act of instructing by question and answer; interrogation. CAT'ECHISED, pp. *-kīzd*. CAT'ECHISER, n. one who. CAT'ECHISM, n. *-kīzm*, a book on any subject arranged for instruction in the form of question and answer. CAT'ECHIST, n. one who instructs in the principles of religion; a catechiser. CAT'ECHIS'TIC, a. *-kīs'tik*, or CAT'ECHIS'TICAL, a. *-tī-kāl*, imparting instruction by way of question and answer. CAT'ECHET'IC, a. *-kēt'ik*, or CAT'ECHET'ICAL, a. after the manner of a catechism. CAT'ECHET'ICALLY, ad. *-lī*. CATECHETICAL SCHOOLS, schools of theological instruction in the Christian Church of the

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early centuries, among which those at Antioch and Alexandria were famous. CAT'ECHU'MEN, n. -kū'měn, in the *anc. church*, one not yet fully instructed in the principles of Christianity, but under instruction; one being prepared for baptism.

CATECHISM, *kăt'e-kĩzm*: system of teaching by question and answer; also a book used in such teaching.

Catechisms have long formed one of the principal means employed for popular instruction in the truths and duties of the Christian religion. The composition of the first catechisms was probably suggested by the ordinary oral instruction of catechumens, and was intended for the help both of teachers and of pupils. It appears to have been in the 8th and 9th c. that the first regular catechisms were compiled, of which that by Kero, a monk of St. Gall, and that ascribed to Otfried of Weissenburg, are among the most noted. At later periods, the use of catechisms prevailed chiefly among the opponents of the hierarchy, as among the Waldenses, the Albigenses, the Wickliffites, and, above all, among the Bohemian Brethren. The term C. appears to have been first used in its present sense among the latter. Early in the Reformation, the reformers began to avail themselves of this method of popular instruction, and their catechisms became important instruments in that great religious movement. In 1520, Luther published his first short C. In 1525, Justus Jonas and John Agricola were intrusted with the preparation of a C. In 1529, Luther published his Larger and Smaller Catechisms, which found a place among the symbolical books or standards of the Lutheran churches. A number of catechisms were published also by the Swiss reformers, and by those of England and other countries. The Geneva catechisms, Larger and Smaller, were the work of Calvin. They were published 1536, were speedily translated into various languages, and became acknowledged standards of the Reformed churches, not only in Switzerland but in the Low Countries, in France, and in Hungary. The Church of Geneva has set aside the authority of these catechisms.—The Zurich C. is received as a standard in the Church of Zurich.—The Heidelberg or Palatinate C. is of greater importance, however, than any other as a standard of the Swiss Reformed churches. It was compiled by the Heidelberg theologians, Caspar Olevian and Zacharias Ursinus, at the request of the elector Frederic III. of the Palatinate; it was published 1563, was approved by several synods, and was subjected to a revision by the Synod of Dort.—In the Church of Rome the Tridentine C. is of high authority. It was prepared in accordance with the decrees of the Council of Trent, by Abp. Leon. Marino, Bp. Ægidius Foscorari, and the Portuguese Dominican, Francis Fureiro; revised by Cardinals Borromeo, Sirlet, and Antonian, and sanctioned by Pope Pius V.; published Rome 1566.—The C. of the Orthodox Greek Church was prepared by Peter Mogilas, metropolitan in Kiew, and published 1642. It received authority as a standard or symbolical book from a synod at Jerusalem 1672. It is often called the

Larger Russian C., to distinguish it from the Smaller C. prepared by order of Peter the Great.—Besides these catechisms, which have historic interest, or are important from their symbolical character, there have appeared at all periods, since the Reformation, many others, Protestant and Rom. Cath., some doctrinal, some controversial, some devoted to particular subjects, as the sacraments, or to particular purposes, as the preparation of candidates for admission to the Lord's Supper, some adapted to the mental capacity of very young children, etc. The opinion, however, has become prevalent in later years that doctrinal abstracts not recorded as having any special use for instruction of children in the apostolic church are not the best form in which religion can be presented to the young, and the use of catechisms has accordingly been in some large groups of churches relinquished in favor of more directly scriptural instruction.

The C. of the Church of England, in its most familiar form, is the smaller one published in the Book of Common Prayer. It is in two parts: the first contains and explains the baptismal covenant, the creed, the ten commandments, and the Lord's prayer; the second explains the two sacraments, baptism and the Lord's Supper. It is not known with certainty who was the author of the first part; probably Cranmer and Ridley had the principal hand in framing the questions and answers. It was originally put forth with the 42 Articles in the reign of Edward VI., and condemned as heretical in the reign of Mary. It must not be confounded with Cranmer's C., which was a larger work, differently arranged, and translated chiefly from the German C. used in Nuremberg. This first part of the church C. is spoken of as the *Shorter* Catechism.

There was a *larger* church C. compiled also in the reign of Edward VI., by Ponet, as is supposed, and it corresponds in some degree with the smaller work above described. It was afterward revised and enlarged by Noel, dean of St. Paul's, and published 1570; and, though never officially promulgated by the church, it has some authority from having been approved by the lower house of convocation. At the Hampton Court Conference, in the reign of James I., the *Shorter* C. was considered too short, and the larger one of Noel's too long; and accordingly, at the king's suggestion, an addition was made to the former of that explanation of the two sacraments which now forms the second part of the church catechism. This was drawn up by Dr. Overall. The whole is a work much esteemed by all sections of the church, as remarkable for its simplicity, truth, and catholicity. It, however, states the baptismal theory in a way not acceptable to the low church party. The rubrics in the Common Prayer Book enjoin the teaching of the C. in the church on Sundays and holidays after the second lesson at evening prayer, and the 59th canon contains a like injunction, imposing penalties on the clergy who neglect this. The custom of catechising in the church had fallen into almost universal disuse, but in many parishes it has been revived with excellent results.

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The Larger and Shorter Catechisms, which, with the Westminster Confession of Faith, constitute the standards or symbolical books of the Presb. churches throughout the British empire and the United States, were compiled by the Assembly of Divines at Westminster (q. v.)—the Shorter C. ‘to be a directory for catechising such as are of weaker capacity;’ the Larger ‘for catechising such as have made some proficiency in the knowledge of the Christian religion.’ The Shorter C. was presented to the English house of commons, 1647, Nov. 5; the Larger, 1648, Apr. 14; and 1648, July, both received the sanction of the general assembly of the Church of Scotland—the general assembly, in the act approving of the Larger C., declaring it to be ‘a rich treasure for increasing knowledge among the people of God,’ and that ‘they bless the Lord that so excellent a catechism has been prepared.’ The Shorter C. has, however, been far more generally used for the purpose of instruction than the Larger, which has been generally felt to be too minute in its statements, and too burdensome to the memory to be employed as a catechism. Even the Shorter C. is regarded by many, who substantially adhere to its doctrine, as carrying the statement of dogmatic theology beyond what is proper for elementary instruction, while it has been long felt to be unsuitable for the very young and the very ignorant, and its use is now almost always preceded by that of catechisms more adapted to their capacity. Its influence, however, has been very great in forming the religious opinions, and in exercising and training the intellectual faculties, wherever Presbyterianism has prevailed; for it has been, and still is, in almost universal use among Presbyterians speaking the English language; and in former days had extensive use among Independents or Congregationalists both in Britain and in America; the Congregationalists have now largely discontinued its public or official use. In Holland, also, a translation of it has been much used. It is generally regarded, by those whose doctrinal views are in accordance with it, as an admirable compend of Christian doctrine and duty.—The authorship of the Westminster Assembly’s catechisms has been the subject of much debate, or at least the authorship of the first drafts of them, it being admitted that they were prepared with great care by committees of the assembly. But it seems probable that their authorship is to be ascribed entirely to these committees, and that, like the Westminster Confession of Faith, they are thus the result of the joint labors of many. From discoveries made by the late Dr. M’Crie it seems probable that at least the plan or scheme of the Shorter C. is to be ascribed to Herbert Palmer (1601–47).

CATECHU, n. *kăt’ě-shû*, or CUTCH, n. *kűch* [said to be from Japanese *cate*, a tree, and *chu*, juice]: dry brown extract used both as a coloring matter and medicinally as an astringent. The C. of commerce is obtained chiefly from East Indian trees, such as the C. tree (*Acacia Catechu*), betel-nut, etc.; but the greater part of that which is exported from India is made from the C. tree. It is known in India by the name *Kutt*. CUTCH is another form, and

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is a common commercial name. The heart-wood alone of the tree yields C., which is obtained by cutting it into small chips and boiling it in water, straining the liquid from time to time, and adding fresh supplies of chips, till the extract is of sufficient consistence to be poured into clay molds, which are usually of a square shape; or when of the thickness of tar it is allowed to harden for two days, so that it will not run, and is formed into balls about the size of oranges, which are placed on husks of rice or on leaves, and appear in commerce enveloped in them. The C. manufacturers in n. India move to different parts of the country at different seasons, and erect temporary huts in the jungles, where they carry on their operations. The C. tree abounds chiefly in the Bombay and Bengal presidencies; is a small, erect, thorny tree, with a roundish head of (generally) prickly branches. Its sap-wood is yellow, the heart-wood dark red. C. is brittle and can readily be broken into fragments; is soluble in water, and possesses an astringent taste, but no odor. It is a very permanent color, and is employed in the dyeing of blacks, browns, fawns, drabs, and greens. It contains much tannin, and an acid called *Catechuic* acid, which can be isolated in white silky crystals. It is often adulterated with earthy substances, but its ready solubility in water and alcohol should at once show their presence by leaving them behind in an insoluble state.—The C. of the betel-nut is obtained by boiling first the nuts and then the extract to a proper consistency. A first boiling of the nuts for some hours is said to yield a black kind of C., called *Kassu*; and a second boiling, after the nuts are dried, a yellowish-brown kind, called *Coury*, which is considered the best, and is sold for the highest price. The former appears in commerce under the name of Colombo C. or Ceylon C. (or Cutch), in the form of circular, flat cakes, covered on one side with husks of rice. The latter does not seem to reach Europe.—Gambir (q.v.) may be regarded as a kind of catechu. Kino (q.v.) is sometimes confounded with catechu. *Terra Japonica*, or JAPAN EARTH (see TERRA) is an old name for C., not quite disused, given to it on the supposition of its being an earthy substance from Japan.

CATECHUMENS, *kăt-e-kū'měnz* [see CATECHIZE]: In the early Christian Church those converted Jews and heathens who had not yet received baptism, but were under preparatory training and instruction. They had a place assigned in the congregation, but were not permitted to be present at the Lord's Supper. In the apostolic age, converts appear to have been at once admitted to the ordinances; but afterward, with the growth of sacramentarian views, a period of probation was required. The C. were in different classes or grades, according to proficiency; those of the lowest grade were not permitted to be present during the prayers of the congregation; and those only of the highest, and who had been declared fit to be baptized at the next administration of the ordinance, were permitted to witness the Lord's Supper.—The term C. was afterward employed to designate young members of the Christian

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Church who were receiving instruction to prepare them for the Lord's Supper, and it is still often used in this sense.

CATEGORIES, *kăt'e-go-rîz*, in Logic: a designation that has come down from the time of Aristotle. One of the books of his *Organon* or logical system is so named. The C., or Predicaments, as the schoolmen called them, are an attempt at a comprehensive classification of all that exists, for the purposes of logical affirmation, proof, or disproof. The entire universe may be classified in various ways—as into things celestial and terrestrial; into matter and spirit, into organized and unorganized; into minerals, plants, animals, etc. But the classification contemplated under the C. proceeds on the very general properties or attributes that most extensively pervade all existing things, although in unequal degrees. A good example of such properties is quantity, which pertains to everything that we know or can think of. Below is the Aristotelian enumeration—the first column is the original Greek; the second, the Latin rendering of the schoolmen; the third, the nearest corresponding English words:

Οὐσία,	Substantia,	Substance.
Ποσόν,	Quantitas,	Quantity.
Ποιόν,	Qualitas,	Quality.
Πρὸς τι,	Relatio,	Relation.
Ποιεῖν,	Actio,	Action.
Πάσχειν,	Passio,	Passivity.
Ποῦ,	Ubi,	Position in Space.
Πότε,	Quando,	Position in Time.
Κεῖσθαι,	Situs,	Situation.
Εχειν,	Habitus,	Possession.

John Stuart Mill has the following remarks on the above scheme: 'The imperfections of this classification are too obvious to require, and its merits are not sufficient to reward, a minute examination. It is a mere catalogue of the distinctions rudely marked out by the language of familiar life, with little or no attempt to penetrate, by philosophical analysis, to the *rationale* even of these common distinctions. Such an analysis, however superficially conducted, would have shown the enumeration to be both redundant and defective. Some objects are admitted, and others repeated several times under different heads. It is like a division of animals into men, quadrupeds, horses, asses, and ponies. That, for instance, could not be a very comprehensive view of the nature of relation, which could exclude action, passivity, and local situation from that category. The same observation applies to position in time and position in space, while the distinction between the latter and situation is merely verbal.'—*Logic*, book i., chap. iii., § 1. Some writers have endeavored to save the C. from these objections, by declaring that the fourth, relation, is to be looked upon as a general head, comprehending the remaining six under it. But there is no evidence that Aristotle had this view in his mind; on the contrary, it appears almost certain that his idea of relation was too narrow and limited to admit of his giving it so great a comprehension.

Mill gives as the result of his own analysis, the following

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enumeration and classification of existences or describable things :

1. Feelings, or States of Consciousness; which are the most comprehensive experience that the human mind can attain to, since even the external world is known only as conceived by our minds.

2. The Minds which experience those feelings.

3. The Bodies, or External Objects, which are supposed to excite all that class of feelings that we denominate sensations.

4. The Successions and Coexistences, the Likenesses and unlikenesses, between feelings or states of consciousness. Although those relations are considered by us to subsist between the bodies, or things, external to our minds, we are driven in the last resort to consider them as really subsisting between the states of each one's own individual mind.

Mill shows that all possible propositions—and it is with the truth or falsehood of propositions that the science of logic has chiefly to do—affirm or deny one or other of the following properties or facts : Existence—the most general attribute of all—coexistence, sequence or succession, causation—a peculiar case of succession—and resemblance. It is to arrive at this classification of propositions, for the purposes of logic, that the foregoing analysis, corresponding to the Aristotelian C., was made. The properties affirmed of any thing or things, or the things of which any properties are affirmed, come under some one or other of the four heads above given.

The C. of Kant, sometimes brought into comparison with those of Aristotle, are conceived in a totally different view. See Sir W. Hamilton's *Discussions on Philosophy*, 2d edit., p. 26. They refer to certain forms supposed to be inherent in the understanding itself, under which the mind embraces the objects of actual experience. The Kantian philosophy supposes that human knowledge is made up partly of the sensations of outward things—color, sound, touch, etc.—and partly of intuitions existing in the mind prior to all experience of the actual world. This is the point of difference between the school of Locke—who rejected all innate ideas, conceptions, or forms—and the school of Kant. No such question was raised under the Aristotelian categories. Kant's enumeration of his innate forms is as follows : 1. Quantity, including unity, multitude, totality; 2. Quality, including reality, negation, limitation; 3. Relation, including substance and accident, cause and effect, action and reaction; 4. Modality, which includes possibility, existence, necessity. These indicate the elements of our knowledge *a priori*; it being the opinion of the author, that such notions, as causation, necessity, etc., cannot be obtained from the exercise of our senses and intelligence upon the world of realities, but must have been in one way or another imprinted upon the mind originally. See KANT.

CATEGORY, n. *kăt'ě-gör ĭ* [Gr. *kategōriă*, an accusation—from *kata*, against; *agoreu'ō*, I speak in an assembly]: in logic., the general head of a class, to one among a certain

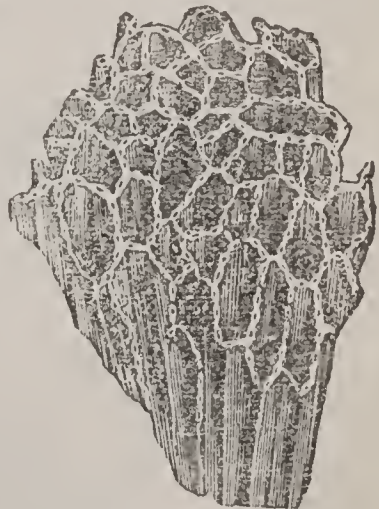
CATENA -- CATER.

number of which anything whatever is referable; a class; an order of ideas (see CATEGORIES); predicament. CAT-EGORIC, a. *kăt'ě-gôr'ik*, or CAT-EGOR'ICAL, a. *-ě-kāl*, absolute; positive; direct; without possibility of evasion. CAT-EGORICALLY, ad. *-lě*. CAT-EGOREMATIC, a. *-ě-măt'ik* [Gr. *kategōrēma*, a predicate]: in *logic.*, capable of being employed by itself as a term; also CAT-EGOR'EMATICAL, a. *-i-kāl*. CAT-EGOREMAT'ICALLY, ad. *-lě*.—SYN. of 'category': state; situation; predicament; condition.

CATENA, n. *kăt'ě-na* [L. *catena*, a chain]: a chain or series of things connected with each other; in *music*, a chain, or succession, of short instrumental shakes.

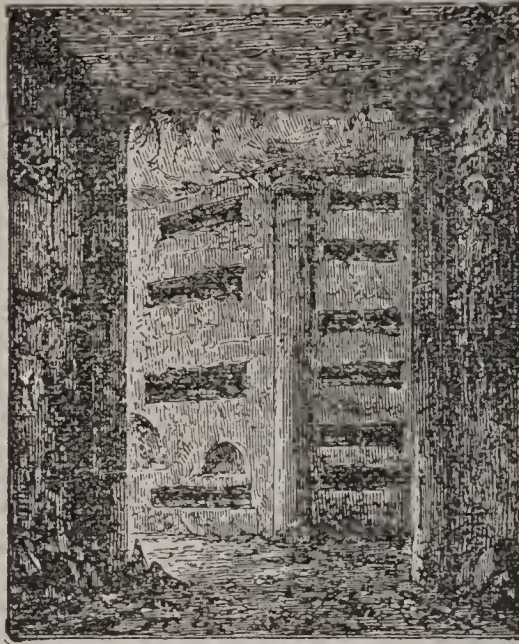
CATENATE, v. *kăt'ě-năt* [L. *catēna*, a chain]: to connect, as a series of links in a chain. CAT'ENATING, imp. CAT'ENATED, pp. CAT'ENA'TION, n. *-năt'shŭn*, regular connection, as the links of a chain. CAT'ENARY, a. *-něr-ě*, relating to a chain; also CAT'ENA'RIAN, a. *-năt'rě-ăn*. CAT-ENARY CURVE, curve formed by a flexible homogeneous cord hanging freely between two points of support, and acted on by no other force than gravity. If the cord is not homogeneous, and the density varies in any regular way, the cord hangs in a curve slightly different from the ordinary catenary. The catenary possesses several remarkable properties, one of which is that its centre of gravity (q.v.) is lower than that of any curve of equal perimeter, and with the same fixed points for its extremities. Where the cord is such that the weight of any part of it is proportioned to its horizontal projection, the curve is a parabola (q.v.). The latter curve and the ordinary catenary are of importance chiefly in the theory of suspension bridges (q.v.). For the properties of the catenary curve, fully analyzed, see the leading works on mechanics. CATENULATE, a. *kă-těn'ă-lăt*, put together like the links of a chain.

CATENIPORA, n. plu. *kăt'ěn-ĭp'ô-ră*, or CATENIPORES, n. plu. *kă-těn'ĭ-pôrs* [L. *catēna*, a chain; *pōrus*, a channel, a pore]: genus of fossil lamelliferous corals peculiar to Palæozoic strata; easily recognized. The cells are terminal and oval, arranged like a loose network of chains, hence called 'chain coral,' or 'chainpore coral.' Vertical anastomosing lamellæ united the cells together, and formed a hemispherical polypidom, sometimes of great size.

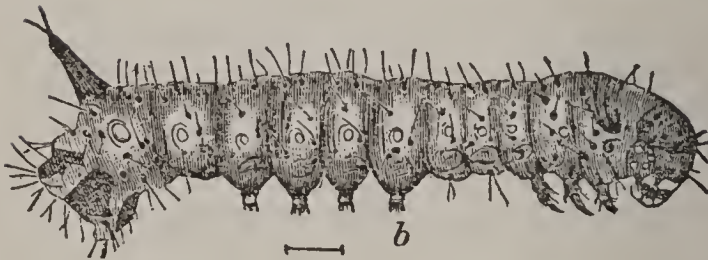


Catenipora escharoides.

CATER, v. *kă'těr* [Norm. F. *acater*, to buy; *acat*, a purchase: F. *acheter*, to buy; *achat*, a purchase: It. *accattare*, to acquire, to get: mid. L. *accaptĭrĕ*, to purchase—from L. *accipĕrĕ*, to receive, to take to one's self]: to provide food; to purchase provisions. CA'TERING, imp. CA'TERED, pp. *-tĕrd*. CATERER, n. *kă'tĕr-ěr*, the person who seeks out and provides the provisions,



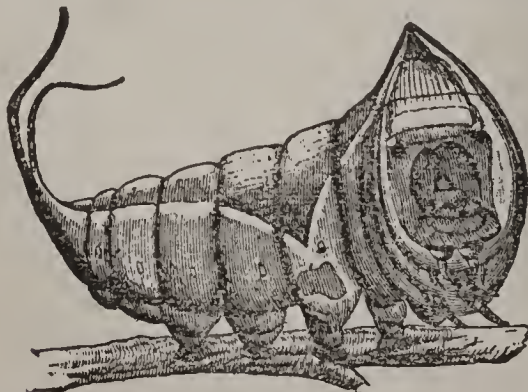
Catacomb of St. Agnes, Rome.



a, *Chocrocampa tcrsa*, showing eye-like spots; *b*, Young caterpillar of *Deilephila Euphorbide*.



Caterpillar.—Peripatus: Survival of ancestral insects.



Caterpillar.—Terrifying attitude of larva of *Dicranura vinata*.

CATERAN—CATERPILLAR.

CA'TERESS, n. fem. CATERY, n. *kā'tēr-ĭ*, in *OE.*, the store room where provisions were kept.

CATERAN, n. *kā'tēr-ān* [Ir. *ceatharnach*, a soldier; Gael. *ceathairneach*, a freebooter, a robber; *cath*, a battle; W. *cedyrn*, strong or mighty ones]: in *Scot.*, a Highlander who came down from the hills to plunder in the Lowlands; a kern.

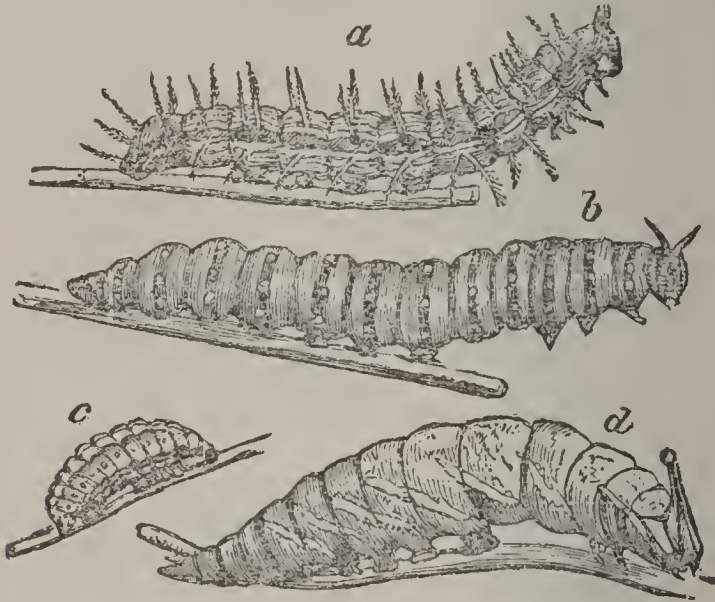
CATER-COUSIN [F. *quatre*, four]: in *OE.*, a cousin in the fourth degree; an intimate friend.

CATERINA, *kāt-ā-rē'nā*, SANTA: town of Sicily, province of Caltanissetta, 7 m. n.n.w. of the town of Caltanissetta. It is on a hill near the river Salso, is fortified, has manufactures of fine earthenware; and in the neighborhood are found jaspers and agates of good quality. Pop. 5,800.

CATERPILLAR, n. *kāt'ēr-pĭl'lēr* [*OE.* *cates*, food; F. *piller*, to plunder. *Note.*—Skeat suggests OF. *chate*, a she-cat; and CF. *pelouse*; It. *peloso*, hairy—from L. *pilōsus*, hairy—thus signifying 'a hairy she-cat;' it may perhaps have been named from its resemblance to the *catkins* of a nut]: name given to the larvæ of lepidopterous insects—butterflies, moths, and hawk-moths. Caterpillars exhibit as great differences as subsist among the perfect insects into which they change; and the family, genus, and species may be determined by the characters of the C. as well as of the perfect insect. Their body is generally long, nearly cylindrical, soft, and consisting of twelve rings or segments besides the head, with nine spiracles or small openings for respiration on each side. The head is much harder than the rest of the body, of almost horny substance, and has six small shining points on each side, regarded as simple or *stemmatic* eyes, and is also furnished with two very short rudimentary antennæ. The mouth is adapted for tearing, cutting, and masticating the substances on which the C. is destined to feed, which are very various in the different species, although in all extremely different from the food of the perfect insect: it is provided with two strong *mandibles*, or upper jaws; two *maxillæ*, or lower jaws; a *labium*, or lower lip; and four *palpi*, or feelers. In the mouth also is situated the *spinneret* of those species which, when they change into the chrysalis or pupa state, envelop themselves in silken cocoons: see SILK-WORM. The first three segments of the body are each furnished with a pair of feet, which are hard and scaly, and represent the six feet of the perfect insect; some of the remaining segments also are furnished with feet, varying in all from four to ten in number, the last pair situated at the posterior extremity of the body; but these feet are soft and membranous or fleshy, and armed at their extremity with a sort of circlet of minute hooks. All the feet or legs are very short. Those caterpillars in which the *pro-legs*, as they are sometimes called, or supplementary soft feet, are nearly equally distributed along the body, move by a sort of regular crawling motion; but those which have only four such feet, situated near the posterior extremity, move by alternately taking

CATERPILLAR-CATCHER.

hold by what may be called their fore-feet and their hind-feet, now stretching the body out to its full length, and now bending it into an arch, while the hinder part is brought forward almost into contact with the forepart. Caterpillars which move in this way are called *geometers* or *loopers*. Some caterpillars have the power of fixing themselves by the two hind feet to a twig, and stretching themselves out as straight as a rod, so that, being in color



Caterpillars of Butterflies.

a, silver-washed fritillary; b, swallow-tailed;
c, chalk-hill blue; d, purple emperor.

very like a twig of the tree on the leaves of which they feed, they are not readily observed. The muscular power required for this position of rest is very great, and Lyonnnet found the number of muscles in a C. to be more than 4,000. The skin of some caterpillars is naked, that of others is covered with hairs, spines, or tubercles. Some make for themselves nests or tents of silk, under which they dwell in societies, protected from the inclemency of the weather. Many construct cases or sheaths by agglutinating various substances together, as the C. of the common clothes-moth. Some roll together leaves, and fix them by threads, so forming a dwelling for themselves; and a few burrow and excavate galleries in the substance of leaves. Many feed on leaves, many being limited to a particular kind of plant, or to a few nearly-allied plants. Some feed on flowers, some on seeds, some on roots, and some even on the woody portions of stems; some on wool, hides, furs, and other animal substances; a few on lard, and other kinds of fat. The admirable harmony pervading all nature is illustrated in the adjustment of the time of each kind of C.'s appearance to that of the leaf or flower on which it is to feed.

CATERPILLAR CATCHER: a bird belonging to the Shrike family, living mainly on caterpillars; a sub-family of *Ampelidæ* (Chatterers), found chiefly in the warmer parts of the eastern hemisphere, though one genus is American.

CATERWAUL—CATGUT.

CATERWAUL, v. *kăt'ér-wawl'* [from *cat*, and *waul*, to cry as a cat]: to make a noise, as cats at night under the influence of the sexual instinct; to make a harsh, disagreeable noise. CAT'ERWAUL'ING, imp.: N. a loud, disagreeable noise made by cats. CAT'ERWAULED, pp. *wauld*.

CATES, n. plu. *kâts* [said to be a mere abbreviation of *delicates* or *delicacies* (see CATER)]: dainties; cakes; nice food.

CAT-FISH, *kăt'fîsh*: of the family *Siluridæ*, genus *Pimelodus*; marked by a slimy skin without scales, and eight fleshy barbules on the head. Some 50 varieties exist, and 16 or more in the inland waters of the United States. The commonest is the horned pout or bullhead, *P. atrarius*, which has sharp spines adjoining the pectoral fin; these it can stiffen at will into a formidable weapon. This species is small, but much used for food. Another variety, *P. pimapterus*, familiar in the e. and middle states, has no ventral fins. Larger species are found in the lakes, *P. nigricans* and *P. cænosus*; in the n. *P. borealis*; in Del., *P. albidus*; in La., *P. punctulatus*; and under various names in the Ohio and Mississippi, where they are sometimes found six ft. in length and in weight 100 to 200 lbs. They are all sluggish in movement and fond of muddy bottoms. Akin to these fresh-water species, and superior to them for food, is the sea-catfish, *Galeichthys Marinus*.

CAT'GUT: material prepared usually from the the intestines of the sheep, rarely from those of the horse, ass, or mule, and *not* from those of the cat; used for strings of violins, harps, guitars, and other musical instruments; as also in the cords used by clock-makers, in the bows of archers, and in whip cord. The first stage in the operation, is the thorough cleansing of the intestines from adherent feculent and fatty matters, after which they are steeped in water for several days, so as to loosen the external membrane, which can then be removed by scraping with a blunt knife. The material which is thus scraped off is employed for the cords of battledoors and rackets, and also as thread in sewing the ends of intestines together. The scraped intestines are then steeped in water, and scraped again, when the large intestines are cut and placed in tubs with salt, to preserve them for the sausage-maker; and the smaller intestines are steeped in water, thereafter treated with a dilute solution of alkali (4 oz. potash, 4 oz. carbonate of potash, and three to four gallons of water, with occasionally a little alum), and are lastly drawn through a perforated brass thimble, and assorted into their respective sizes. In order to destroy any adherent animal matter, which would lead to putrefaction, and the consequent development of offensive odors, it is customary to subject the C. to the fumes of burning sulphur—sulphurous acid which acts as an antiseptic (q.v.), and arrests decomposition. The best strings are used for musical instruments; and those which come from Italy, and are known as *Roman strings*, are strongest. They are remarkable for clearness and transparency.

CATHA—CATHARINA.

Cord for clockmakers is made from the smallest of the intestines, and occasionally from larger ones, which have been split longitudinally into several lengths. Whip-cord is fabricated from C. which has been twisted in a manner somewhat similar to single-corded ropes. The C. obtained from the intestines of horses, asses, and mules is made principally in France, and is used instead of leather-belts for driving machinery.

CATHA, *kāth'a*: genus of the nat. ord. *Celastraceæ*. The fruit is a three-cornered capsule.—*C. edulis*, sometimes called ARABIAN TEA, the KHÂT of the Arabians, is a shrub with erect, smooth branches, elliptical, obtusely-serrated leaves, and small flowers in axillary cymes. It is a native of Arabia, and the Arabs ascribe to its leaves, even carried about the person, extraordinary virtues as a preventive of plague, with probably about as much reason as our forefathers had for esteeming the rowan tree formidable to witches. When fresh, they are stimulant, narcotic, and intoxicating, and are eaten with greediness by the Arabs. They are very antisoporific, so that a man, after using them, may keep watch for a whole night without drowsiness.

CATHARI, *kāth'a-rī*, or CATHARISTS, *kāth'a-rīsts* [Gr., pure]: name of various sects in the church during the middle ages; sometimes assumed in profession of a purity of doctrine and morals superior to that prevalent in the church, sometimes bestowed ironically in ridicule of such a profession, and perhaps first used as a designation of the Paulicians (q.v.). It became a common appellation of sects which appeared in Lombardy in the beginning of the 11th c., and afterward in France and the w. of Germany. Having some connection with the Bulgarian Paulicians, they were sometimes called *Bulgarians*; sometimes also *Putarenes* or *Patarines*, sometimes *Publicans* or *Popelicans*, and in the low countries, *Piphles*. The names *Albigenses* and C. are often used as equivalent to one another; but we are under the disadvantage of having to depend entirely on the writings of very bigoted adversaries for our knowledge of their doctrines and practices, and considerable obscurity rests on all this interesting part of ecclesiastical history. Manichæism, Gnosticism, and Montanism are ascribed to the C.; but there is much reason to think that the errors of a few were often indiscriminately charged upon all, and that such charges indeed sometimes rested on ignorant or wilful misconstruction. It appears certain, that the C. differed considerably in their doctrines and in the degree of their opposition to the dominant church. Some of them advocated and practiced a rigid asceticism. There is no good evidence that any of them nearly approached to the doctrines of the Reformation; though in their rejection of tradition, of the authority of Rome, of the worship of saints and images, etc., there are notable points of agreement with the views of the reformers.

CATHARINA, *kāth'a-rē'na*, SAINT: a virgin, said to have been of royal descent in Alexandria, who, at 18 years of age, publicly confessing the gospel at a sacrificial feast

CATHARINA OF SIENNA—CATHARINE I.

appointed by the emperor Maximinus, was put to death in 307, after being tortured on a wheel. Hence the name 'St. Catharine's wheel.' Very extraordinary legends exist as to her converting 50 philosophers sent by the emperor to convert her in prison, besides a multitude of other persons; the conveyance of her head by the angels to Mount Sinai, etc. She is the patron saint of the philosophical faculty of the Univ. of Paris, and is regarded as the patroness of girls' schools. Her day is Nov. 25, or, as some say, Mar. 5.

CATHARINA OF SIENNA, SAINT: 1347-1380, Apr. 29; daughter of a dyer: one of the most famous saints of Italy. She practiced extraordinary mortifications, and was said to have received extraordinary tokens of favor from Christ, whose five wounds were impressed upon her body, etc. She became a Dominican, and therefore afterward a patron saint of the Dominicans. C. was canonized 1461; her day is Apr. 30. She wrote devotional pieces, letters, and poems, which have been more than once printed; the best edition appeared at Siena and Lucca 1707-13, 4 vols. 4to, *Opere della serafica Santa Catarina*.

Other saints named *Catharina*, of the Roman calendar, are:

CATHARINA OF BOLOGNA, 1413-1463, Mar. 9; canonized 1724. CATHARINA OF GENOA, 1447-1510, Sep. 14; canonized 1737; revered for rapt and devout piety of the mystical type (see her life by Upham, *Life of Catharina Adorna*, New York, 1856). CATHARINA OF SWEDEN, 1331-1381, Mar. 24; canonized 1474 (day Mar. 22). CATHARINA RICCI, 1522-1589, Feb. 2; canonized 1746.

CATHARINE, *kāth'ér-în*, I.; Empress of Russia (originally by name Martha Rabe): 1682-1727, May 20; posthumous daughter of John Rabe, a Swedish quartermaster in Livonia. Her mother died when C. was but three years old. Left helpless and destitute, a parish-clerk took compassion on her, and supported her, and a Lutheran clergyman in Marienburg afterward received her into his house as an attendant on his children. In 1701, she married a Swedish dragoon, who next year was called to active service; and Marienburg being taken by the Russians, she became for some time the mistress of General Bauer; and afterward entering the service of the Princess Menchikoff, she attracted the notice of Peter the Great. In 1703, she went over to the Greek Church, and took the name of Catharina Alexiowna. After being for some years the emperor's mistress she was privately married to him 1711; the marriage was publicly avowed 1712; she was proclaimed empress 1718, and was crowned at Moscow 1724. She bore eight children to the emperor, all of whom died in childhood, except two daughters, Anne and Elizabeth, the latter of whom was afterward empress of Russia, and the former married the Duke of Holstein, and was the mother of the emperor Peter III. When Peter the Great and his army seemed entirely in the power of the Turkish army on the Pruth in 1717, C., who was with him, sought an interview with the grand vizier, and, by employing her jewels to

CATHARINE II.

bribe his attendants, succeeded in procuring the deliverance of the Russians. Her conduct on this occasion excited so much admiration and gratitude in the emperor; that he resolved to appoint her his successor. Yet in the end of the year 1724, she became the object of his displeasure and suspicion, on account of an alleged intimacy with a chamberlain, whom he caused to be beheaded. Menchikoff, who had always been attached to her interests, was at this time in disgrace. But she had contrived in a great measure to recover her position, when, 1725, Jan. 28, Peter the Great died. His death was kept secret as long as possible, that everything might be arranged for her taking possession of the throne, and the Abp. of Pleskow came forward and declared before the troops and people that the emperor, on his death-bed, had declared her alone worthy to be his successor. The hostility and hesitation of the nobles were at once overcome and C. was acknowledged as empress and sole ruler of all the Russias. Under Menchikoff's direction the affairs of government went on well enough for a time, but the empress ere long began to yield to the influence of a number of favorites, addicted herself to drunkenness, and lived such a life as could not fail to hurry her to the grave. Her death, however, came unexpectedly soon.

CATHARINE II., Empress of Russia: 1729, Apr. 25—1796, Nov. 9; b. Stettin, dau. of the Prince of Anhalt-Zerbst, a Prussian field-marshal, and gov. of Stettin. She received the name of Sophia Augusta; but the empress Elizabeth of Russia, having selected her for the wife of her nephew and intended successor, Peter, she passed from the Lutheran to the Greek Church, and took the name of Catharina Alexiowna. In 1745, her marriage took place. She soon quarrelled with her husband, and each of them lived a life of unrestrained vice. Among his attendants was a Count Soltikow, with whom her intimacy soon became scandalous; and Soltikow was sent on an embassy abroad. But the young Polish count Stanislaus Poniatowski, almost immediately supplied his place. After the death of the empress Elizabeth 1761, Peter III. ascended the Russian throne; but the conjugal difference became continually wider. C. was banished to a separate abode; and the emperor seemed to entertain the design of divorcing her, of declaring her only son, Paul, illegitimate, and of marrying his mistress, Elizabeth Woronzow. The popular dislike to Peter, however, rapidly increased; and at length he was dethroned by a conspiracy, and C. was made empress. A few days afterward, Peter was murdered (1762, July). What participation his wife had in his murder has never been well ascertained.

C. now exerted herself to please the people, and among other things made a great show of regard for the outward forms of the Greek Church, though her principles were, in reality, those of the infidelity then prevalent among the French philosophers. The government of the country was carried on with great energy; and her reign was remarkable for the rapid increase of the extent and power of Russia. Not long after her accession to the throne, her

influence secured the election of her former favorite, Stanislaus Poniatowski, to the throne of Poland. In her own empire, however, discontentment was seriously manifested, the hopes of the disaffected being centred in the young prince Ivan, who was forthwith murdered in the castle of Schlüsselburg. From that time the internal politics of Russia long consisted in great part of court intrigues for the humiliation of one favorite and the exaltation of another. The first partition of Poland in 1772, and the Turkish war which ended in the peace of Kainardji 1774, vastly increased the empire. The Turkish war ending in the peace of Jassy 1792, had similar results, and also the war with Sweden, which ended 1790. The second and third partitions of Poland, and the incorporation of Courland with Russia, completed the triumphs of C.'s reign. She began a war with Persia, however, and cherished a scheme for the overthrow of the British power in India; but was cut off by a stroke of apoplexy. She was a woman of great ability but utterly devoid of principle; she shrank from no crime, and sensuality and ambition governed all her actions. She was shameless in vice, and always had a paramour who dwelt in her palace, and might be regarded as filling an acknowledged office of state, with large revenues and determinate privileges. Yet distinguished authors flattered her, and she invited to her court some of the literati and philosophers of France. She was ever ready to commence great undertakings but most of them were left unfinished, and little was really accomplished in her reign for the improvement of the country or the progress of civilization. On a visit to the southern provinces of the empire 1787, she was gratified by a perpetual display of fictitious wealth and prosperity along the whole route. This imperial progress was also a triumphal procession of her vile favorite Potemkin (q.v.).

CATHARINE DE' MEDICI, *dā mēd'e-chē*, Queen of Henri II. of France: 1519–1589, Jan. 5; b. Florence; daughter of Lorenzo de' Medici, Duke of Urbino. In her 14th year she was brought to France and married to Henri, second son of Francis I. The marriage was a part of the political schemes of her uncle, Pope Clement VII., but as he died soon afterward she found herself friendless and neglected at the French court. In these circumstances she conducted herself with a submission which seemed to indicate a lack even of proper spirit, but which gained her the favor of the old king, and in some measure also of her husband. It was not till the accession of her eldest son, Francis II., 1559, that her love of power began to display itself. The Guises at this time possessed a power which seemed dangerous to that of the throne, and C. entered into a secret alliance with the Huguenots to oppose them. On the death of Francis II., 1560, and accession of Charles IX., the government fell entirely into her hands. Caring little for religion in itself, though she was prone to superstition, she disliked the Protestants, chiefly because their principles were opposed to the absolute des-

CATHARINE OF ARAGON.

potism which she desired to maintain. Yet she sought to rally the Protestant leaders around the throne, in order to remove the Guises. This attempt having failed, and the civil war which ensued having ended in the peace of Amboise, highly favorable to the Protestants, she became alarmed at the increase of their power and entered into a secret treaty with Spain for the extirpation of heretics, and subsequently into a plot with the Guises, in which at first only the murder of the Protestant leaders was contemplated, but which resulted in the fearful massacre of St. Bartholomew's Day. This event brought the whole power of the state into the hands of the queen-mother, who boasted of the deed to Rom. Cath. governments and excused it to Protestant ones, for she now managed all the correspondence of the court. About this time she succeeded, by gold and intrigues, in procuring the election of her third son, afterward Henri III., to the Polish throne. But her arbitrary and tyrannical administration roused the opposition of a Rom. Cath. party, at the head of whom was her own fourth son, the Duke Alençon, who allied themselves with the Protestants. It was very generally believed that she was privy to the machinations that led to the duke's death. When, after the death of Charles IX., Henri III. returned from Poland to be king of France, his mother still ruled the court and had the principal share in all the intrigues, treacheries, and political transactions of that woful period. Having betrayed all who trusted them she and her son found themselves at last forsaken and abhorred by all. The league and the Guises had no more confidence in them than had the Protestants and Henri of Navarre. Vexation on this account preyed on the proud heart of the queen-mother in her last days, and amid the confusion and strife of parties she died at Blois, unheeded and unlamented. Her ruling passion was ambition, and to this she was ready to sacrifice everything. Her unprincipled policy had almost subverted the French monarchy; her extravagance and luxury exhausted the finances of the country. Her influence was powerful in increasing the demoralization of the court and of society. She unscrupulously employed beauties of her train to corrupt men from whose power she apprehended danger.

CATHARINE OF ARAGON, Queen of England: 1485, Dec.—1536, Jan.; first wife of Henry VIII., fourth daughter of Ferdinand and Isabella, king and queen of Castile and Aragon. She has a prominent place in English history, not for what she herself was, but for what she was the occasion of—the Reformation. Married, when scarcely 16, to Arthur, Prince of Wales, son of Henry VII., she was left a widow within a year, and in the course of a few months more a second marriage was projected for her by her father-in-law, with his second son Henry, as yet a boy of only 12 years old. The pope's dispensation enabling such near relatives to marry was obtained 1503, and the marriage took place 1509, June, immediately after Henry's accession to the crown as Henry VIII. Although Henry

CATHARINE OF BRAGANZA.

was very far from being a model husband he appears to have treated Queen C., who had borne him several children, with all due respect until about 1527, when he conceived a passion for Anne Boleyn (q.v.). He now expressed doubts as to the legality of his marriage, and set about obtaining a divorce. Pope Clement VII. would readily have annulled the marriage permitted by his predecessor had he not feared Queen C.'s powerful nephew, the emperor Charles V. He, however, granted a commission to Campeggio and Wolsey, to inquire into the validity of the marriage; but before these prelates Queen C. refused to plead, and appealed to the pope. The king craved judgment. The legates cited the queen, and, declaring her contumacious when she appeared not, went on with the cause; but the wily Campeggio, anxious only for time for his master when the king expected an answer, prorogued the court until a future day. The king consulted the universities of Europe, many of which declared the marriage invalid. The pope now summoned the king to Rome, but Henry haughtily refused to appear, either himself or by deputy, which he maintained would be to sacrifice the prerogatives of his crown, and, setting the pope at defiance, married Anne Boleyn. Cranmer shortly afterward (1533) declared the first marriage void, and Pope Clement annulled Cranmer's sentence, making the separation from Rome complete. Queen C. did not quit the kingdom, but took up her residence first at Ampthill, Bedfordshire, afterward at Kimbolton Castle, Huntingdonshire, where she led an austere, religious life until her decease. Queen C.'s personal character was unimpeachable, and her disposition sweet and gentle.

CATHARINE OF BRAGANZA, *kath'er-ín ov brá-gán'sá*: Queen of Charles II. of England: 1638-1705, Dec. 31; b. Villa Viçosa, Portugal. Her father, John, Duke of Braganza, was rightful heir to the Portuguese throne, and finally attained it after years of war. To secure an ally against Spain, her mother planned this marriage while Charles was yet in exile. It was arranged after the restoration, Portugal to give £500,000 dowry, with the towns of Tangier and Bombay, and many privileges of trade with the colonies. They were married at Plymouth, 1663, May 13, and the king expressed satisfaction with his bride; but she had been religiously trained, and could not adapt herself to dissolute manners. Charles brought his mistress, Lady Castlemaine, to court, and, when the queen showed indignation, directed Clarendon to lecture her on the duty of submission. Her spirit was broken by open neglect and repeated humiliations, and as a Rom. Cath. she was exposed to suspicion and slander during the popery panic; the commons even entertained accusations against her. England, however, rendered her father decisive aid in the struggle with Spain. C. had no children, lived retired under James II., returned to Portugal 1692, and showed much ability as regent for her brother Dom Pedro in the war with Spain. 1704.

CATHARINE OF VALOIS—CATHARINE-WHEEL.

CATHARINE OF VALOIS, *vâl-wâ'*, or OF FRANCE, Queen of Henry V. of England: 1401, Oct. 27—1437, Jan. 3; b. Paris; dau. of Charles VI. of France and Isabeau of Bavaria. Her father in one of his lucid intervals separated his children from their abandoned mother, who neglected them shamefully: C. was educated in a convent. Henry V., on coming to the throne 1413, demanded her hand with a large dowry and restitution of the provinces claimed by England. This proposition was declined, but Henry's invasion and success at Agincourt and Rouen brought the court, with Philip of Burgundy at its head, to another mind. The treaty of Troyes, 1420, May 21, made Henry regent of France and successor to the throne. He married C. June 2—affection, according to Shakespeare and the traditions, entering into the match as well as policy. C. was crowned at London 1421, Feb. 24, and Henry VI. was b. at Windsor, Dec. 6, and proclaimed king at his father's death in France. 1422, Aug. 31. Within a few years C. privately married Owen Tudor, who had been a squire of Henry V. and was her clerk of the wardrobe. He was of good Welsh family but low position, and the union, though it produced three sons, was long kept secret; its detection exposed C. to disgrace and trouble which probably contributed to her death at Bermondsey abbey. Tudor was sent to Newgate but escaped; their eldest son became Earl of Richmond, married Margaret Beaufort, heiress of the house of Somerset, and was father of Henry VII. and ancestor of the Tudor line.

CATHARINE PARR, sixth wife of Henry VIII.: 1513–48; daughter of Sir Thomas Parr. Married first to Lord Burgh, afterward to Lord Latimer, she, 1543, July 12, became queen of England by marriage with Henry VIII. She was distinguished for her learning and her knowledge of religious subjects, her discussion of which with the king had well-nigh brought her to the block, like so many of her predecessors. Her tact, however, saved her and brought rebuke on her enemies; for she made it appear, to the king's vanity, that she had only engaged him in discourse about the Reformation in order to derive profit from his majesty's speech. She persuaded Henry to restore the right of succession to his daughters, and interested herself on behalf of the universities. After Henry's death she married, 1547, Sir Thomas Seymour, and died the following year, not without suspicion of poison.

CATHARINE'S, SAINT, COLLEGE, or HALL, Cambridge: founded by Robert Wodelarke, provost of King's College, 1473, for a master and three or more fellows. The visitors sent down to the university by Edward VI. ordered that there should be then six fellows, and in future a greater or less number as the revenues permitted. The statutes confirmed 1860, May, provide that there shall be a master and nine fellows. There are 25 scholars. Edwyn Sandys, Abp. of York, Bp. Overall, and Bp. Sherlock, were of this college.

CATHARINE-WHEEL, n. *kăth'ēr-în* [so called from St. *Catharina* (a.v.) of Alexandria, in allusion to the manner

CATHARTES AURA—CATHCART.

of her martyrdom]: in *arch.*, an ornamental window of a circular form, having radiating divisions or spokes like a wheel; a firework of similar form. In *heraldry*, a C. W. is frequently used as a charge in coats of arms, when it is represented with teeth, thus :



CATHARTES AURA: see VULTURE.

CATHARTIC, a. *kă-thâr'tik* [Gr. *kathar'tikos*, purgative, purifying—from *kathaira*, I clean or purge]: purgative: N. a purging medicine, as senna, castor-oil, etc. Cathartics included originally all medicines supposed to purify the system from the matter of disease (*materies morbi*), which was generally presumed by the ancients to exist in all cases of fever and acute disease (see CRISIS), and to require to be separated or thrown off by the various excretions of the body. Ultimately the term C. became limited in its signification to remedies acting on the bowels, popularly called *purgatives*—a mere translation of the Greek word. The principal cathartics are aloes, gamboge, colocynth, rhubarb, scammony, jalap, senna, Epsom and other salts, and castor oil. Sulphur and cream of tartar form a well-known mild laxative; magnesia, also, is useful in many cases of indigestion with acidity. Croton oil and elaterium belong to a more dangerous class of C., as does also the favorite remedy of the ancients—the black hellebore. Many mineral springs produce waters whose cathartic effect is highly beneficial; and their use has in recent years largely taken the place of the more drastic compounded drugs. See CONSTIPATION. CATHAR'TICAL, a. purgative. CATHAR'TINE, n. *-tîn*, or BITTER OF SENNA, the essential laxative or purgative principle in senna. It can be isolated as a yellowish red uncrystallizable solid, which is deliquescent, soluble in water and alcohol, insoluble in ether, has a very bitter, nauseous taste, a characteristic odor, and possesses great purging powers, accompanied by nausea and griping. Three grains of C. are a full dose.

CATHAY, n. *kăth-ā'*: in *OE.*, a name for China, or perhaps Chinese Tartary: see CHINA.

CATH'CART, CHARLES MURRAY, Earl (formerly known as Lord Greenock): 1783–1859, July; eldest son of William, Earl C.: served in Spain and at Waterloo under Wellington; afterward in Canada, and was made a gen. and col. of the 1st dragoon guards.

CATHCART, SIR GEORGE: son of William, Earl C. 1794–1854, Nov. 5; b. London. Educated at Eton and Edinburgh, he, 1810, joined the 2d life guards, and fought with the grand army in the campaigns of 1812, 13; and, as aide-de-camp to the Duke of Wellington, was present at Quatre Bras and Waterloo. In 1828, he was made lieut.col., and served in Brit. America and the W. Indies for about eight years; and then in Canada, where he served more than six years. In 1852, having held the appointment of dep.lieut. of the tower for some years, he was made gov. of the Cape of Good Hope, with command of the forces, and in this capacity brought to a successful end the harassing Kafir war. He returned to England in

CATHCART—CATHEDRAL.

time to be sent out to the Crimea as gen. of division. His bravery here was conspicuous, especially in the battle of Inkermann, where the odds were so terribly against the British forces, and where he was slain. He was buried on the spot where he fell, which, in his honor, was named Cathcart's Hill. C. was the author of a very valuable work, entitled *Commentaries on the War in Russia and Germany in 1812 and 1813* (London, 1850).

CATHCART, *kath'-kart*, WILLIAM SHAW, Earl: British general and diplomatist: 1755, Sep. 17—1843, June 17; son of Baron C. of Cathcart, county of Renfrew. Having studied at Glasgow he entered the army, took a prominent part in the American war, and fought with distinction in Flanders and n. Germany. In 1801, he was made lieut.gen., and in 1803 commander-in-chief for Ireland. In 1805, he was engaged on a diplomatic mission to the Czar Alexander. In 1807, July, he received the command of the land forces employed to co-operate with the fleet in the attack on Copenhagen, and, for his services in this capacity, was made a British peer, with the title of viscount, and received a vote of thanks from both houses of parliament. In 1812, he was sent ambassador to St. Petersburg, accompanied the czar Alexander in the campaigns of 1813, 14, and was present at the congresses of Chatillon and Vienna. He was raised to the rank of earl, 1814, June 18. He died at his country residence, Cartside, near Glasgow.

CATHEDRAL, n. *kǎ-thē'drāl* [mid. L. *cathēdrālis*—from Gr. *kathēdra*, a chair—from Gr. *kata*, down; *hedra*, a seat or chair]: the principal church in a diocese, containing the bishop's official seat or throne: ADJ. pertaining to the principal church of a diocese. CATHE'DRA, n. *-drā*, a professorial or other official seat or chair, but, especially, ecclesiastical; thus, 'to speak *ex cathedrā*,' is to speak as from a *seat* of authority. The cathedral city is the seat of the bishop of the diocese, and his throne is placed in the cathedral church, which is the parish church of the whole diocese. The diocese was, in fact, anciently called *parochia* (parish) until the application of this name to the smaller portions into which the diocese was divided. In England a cathedral town has generally been understood to be entitled to the honors of a city, even though the town be not a borough incorporate; but in the case of Manchester the claim was disallowed by a court of law. The distinction between cathedral and collegiate churches consists principally in the see of the bishop being at the former. The governing body of a cathedral is called the dean and chapter—i.e. the dean and canons who meet for corporate purposes in the chapter-house of the cathedral. The property of the cathedral vests in this body. In England they elect the bishop of the diocese on the issue of a *congé d'élire* from the crown; but as the person to be elected is always named, and they may be compelled by a mandamus to elect that person and no other, the election is merely a form.

The bishop is 'visitor' of the dean and chapter. In England, by the act of 1840, all members of cathedrals, ex-

CATHELINEAU—CATHETER.

cept the dean, are styled canons. Their *seat* in the cathedral, is called their *stall*. They are no longer called prebends. Canons must reside three months in each year. The act allows to the canons of Durham, Manchester, St. Paul's, and Westminster, an income of £1,000 per annum ; to those of every other cathedral in England, £500. The bishop was always considered of common right to have the patronage of canonries, but formerly there were exceptions. Now, the appointment to all canonries is vested either in the bishop or in the crown. Where the bishop is patron, he 'collates,' and the dean and chapter 'induct,' by placing the new canon in a stall in the church. The crown appoints by letters patent, and the canon is installed without collation. Honorary canons have no emoluments, but rank after the canons. Minor canons, of whom there are from two to six in each cathedral, perform the daily choral services. The cathedral service is the usual Church of England service intoned, with an anthem and the psalms chanted. For the general plan of cathedral buildings, see CHURCH: for the more remarkable cathedrals see the names of the towns in which they are situated. In England, the number of cathedrals is above 30.

In the United States each Rom. Cath. bishop has his cathedral church. In the Prot. Epis. Church there is a movement in the direction of the cathedral system, and some dioceses now have their cathedrals.

CATHELINEAU, *kât-le-nō'*, or *kâ-têh-le-nō'*, JACQUES: general of the army in La Vendée, in the w. of France: 1759, Jan. 5—1793, July 11 ; b. in very humble life, at Pin-en-Mauges, Lower Anjou. Horrified at the atrocities and despotic acts of the convention, he placed himself in opposition to it, and soon collected around him a body of loyal peasantry, whom he led against and defeated the republicans in several conflicts. After the victory of Saumur (q.v.) the council of generals appointed him, as having the greatest influence over his countrymen, commander-in-chief. He immediately determined to make an attack upon Nantes, and managed to penetrate into the town, where he was wounded by a musket-ball, and his troops immediately dispersed. He was carried to St. Florent, where he died. He was a man of great simplicity and honesty of character, and his piety was such that he was called the Saint of Anjou.

CATHERINE: see CATHARINE.

CATHETER, n. *kăth'ê-ter* [Gr. *kathêter*, a thing let down or put in]: in *surg.*, formerly any instrument whose use was to be introduced into mucous canals; in modern times generally reserved for tubular rods through which fluids or air may pass, and which may give free exit to the accumulated contents of such organs as the urinary bladder. CATHETERISM, n. *kăth-êt'êr-izm*, the art or operation of introducing a catheter. The catheter for introduction into the bladder is a very old surgical instrument. The ancients made theirs of copper, which accumulated verdigris. In the 9th c. silver was substituted by the Ara-

CATHETOMETER—CATHOLIC CHURCH.

bian surgeons as a cleaner metal, and is still used by all who can procure the best instrument. Inferior catheters are made of German silver or pewter. Flexible catheters are made of gum elastic, which may be used either alone or supported on a wire. Other materials have been proposed. Of late years, gutta percha has been used, but owing to some awkward accidents—such as portions breaking off in the bladder—it has not been generally adopted by surgeons. The urinary C. for the male varies in length from ten to eleven inches; for the female it need not be more than four or five inches. The form is a matter of indifference, but most surgeons prefer an instrument straight to within the last few inches of its length; the latter should be curved into the segment of a small circle. Others, however, use a double curve, and, indeed, nearly every surgeon has a peculiar fancy in this respect.

CATHETOMETER, n. *kăth'ĕ-tŏm'ĕ-tĕr* [Gr. *kathĕtos*, vertical height; *metron*, a measure]: an instrument for measuring differences of vertical heights, consisting of a graduated scale, with a sliding telescope. **CATHETUS**, n. *kăth'ĕ-tŭs*, a line or radius falling perpendicularly on another.

CATHLAPOÓTLE: river in Wash. Terr. rising in the mountain dist. of Skamarria Co., and emptying into the Columbia river in Clarke Co. after a flow of abt. 90 miles.

CATHODE, n. *kăth'ôd* [Gr. *kata*, down; *kodos*, a way]: the surface at which electricity passes out of a body: see **ANODE**.—**CATHODE RAYS**: see **ROENTGEN RAYS**.

CATHOLIC, a. *kăth'ô-lik* [Gr. *kathol'ikos*, universal—from *kata*, down; *holos*, the whole: L. *catholicus*]: universal; general; liberal; not narrow-minded or bigoted: N. a name claimed by, and very frequently applied to the adherents of the Church of Rome (see **CATHOLIC CHURCH**). **CATHOL'ICIZE**, v. *-ĭ-sĭz*, to become a Rom. Cath.; to convert to the Rom. Cath. faith. **CATHOL'ICIZING**, imp. **CATHOL'ICIZED**, pp. *-ĭ-sĭzĭd*. **CATHOLICISM**, n. *kă-thŏl'ĭ sizm*, universality; liberality of sentiments; term claimed for, and generally applied to, adherence to the Church of Rome. **CATHOLICITY**, n. *kăth'ô lis'ĭ-tĭ*, the quality of being universal or catholic; term claimed for, and sometimes applied to, the religion of the Church of Rome. **CATHOLICON**, n. *kă-thŏl'ĭ-kŏn*, a universal medicine. **CATHOLICLY**, ad. *kăth'ô-lik-lĭ*, in a catholic and liberal spirit.

CATHOLIC APOSTOLIC CHURCH: see **IRVINGITES**.

CATHOLIC CHURCH: the Universal Church of Christ, embracing all Christian disciples of all lands and all ages. It cannot properly be applied to any particular sect or body, such as the Roman, Greek, Protestant, Anglican, Genevan, Reformed, Lutheran, Episcopal, Presbyterian, Congregational, or Quaker, all of which form merely portions more or less pure of the 'church universal.' The ancient symbol known as the apostles' creed defines 'the Holy Catholic Church' as being 'the communion of saints.' No 'church' whose rules shut out any whom Christ plainly

CATHOLIC COPTS.

receives as His disciples, can be 'catholic.' The term Catholic was first employed to distinguish the Christian Church from the Jewish, the Jewish being restricted to a single nation, whereas the Christian was intended for the world in general. Afterward, it served to mark the difference between the orthodox Christian Church and the various sects which sprang from it, such as the Cerinthians, Basilidians, Arians, Macedonians, etc. The name has been retained by the Church of Rome, which was the visible successor of the primitive one; and although Protestant divines have been and are careful to deny its applicability to that one church to the exclusion of all others, yet the term Catholic is still used by the populace of almost every Protestant country as synonymous with Roman Catholic, so that from their minds all conception of the literal meaning of the word has vanished. The more enlightened Protestants of the present day, while refusing to the Church of Rome an exclusive claim which they would not make for their own churches, gladly recognize that venerable body as forming a portion of the Universal Church: see ROMAN CATHOLIC CHURCH.

CATHOLIC (or UNITED) COPTS, *köpts*: a body of about 13,000 native Egyptians who acknowledge the pope's supremacy, though observing the Eastern rite. One of their priests was appointed vicar-apostolic and bishop *in partibus*, 1855. They are nominally subject to the patriarch of Alexandria, who is of the Latin rite and lives at Rome.

CATHOLIC EMANCIPATION ACT.

CATHOLIC (ROMAN) EMANCIPATION ACT (10 Geo. IV. c. 7): act of the British parliament, 1829, Apr. 13, removing the legal burdens which had long rested on all adherents of the Church of Rome in that country. From first to last, the sufferings of the Rom. Catholics in Great Britain were the fruit of political tyranny quite as much as of religious rancor or fanaticism, and their release was effected by a change in the political rather than in the religious views or feelings of the dominant party. The first occasion on which even a promise of a different line of policy from that which had been originally adopted was held out to the Rom. Catholics of Ireland, was on the termination of the revolutionary war in 1691; and had King William been able to carry out the views which his personal enlightenment and liberality dictated, it is probable that Rom. Cath. emancipation would have been hastened by more than a century. But the English parliament, which was intensely anti-Roman Cath., enacted, 1691, Oct. 22, that Irish members of both houses should take the oaths of supremacy; and three years later a set of acts were passed which placed the Rom. Catholics in a worse position than at any previous period of their history. The whole population of Ireland was disarmed, and the priests banished from the country. But what was still more intolerable, was the interference with the private arrangements of their families. All Rom. Catholics were prohibited from acting as guardians not only to Protestant, but to Rom. Cath. children. At a somewhat later date (1704) it was enacted that if a son chose to turn Protestant he should be entitled to dispossess his father and at once to take possession of the family estate. Though Rom. Catholics were not directly declared incapable of holding land they were deprived of the right of acquiring it by purchase, or even by long lease; and if a Rom. Catholic chanced to occupy a place in a line of entail, he was passed over in favor of the next Protestant heir. No office of trust, civil or military, was now open to a Rom. Catholic; he was forbidden to vote at elections, to intermarry with a Protestant, or even to dwell in Limerick or Galway, except under certain conditions. But perhaps the most demoralizing provision of all was that which empowered the son of a Rom. Catholic to bring his father into chancery, to force him to declare on oath the value of his property, and to settle such an allowance on him as the court should determine, not only for the father's life, but the son's.

Among the other burdens of this heavy time may be mentioned the exclusion of the Rom. Catholics from the profession of the law, and the regulation that if a Protestant lawyer married a Rom. Catholic, he should be held to have gone over to her faith; the prohibition against Rom. Catholics acting as schoolmasters, under the penalty of being prosecuted as convicts, by which the whole body was virtually excluded from the benefits of education; and the still more summary enactment that if a priest celebrated marriage between a Protestant and a Rom. Catholic, he

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should be hanged. But as years passed away, the memory of the foul deeds of the Inquisition and the confessional, and of the other enormities of which Rom. Catholics had been guilty in their days of power, waxed fainter; milder feelings began to prevail; and when Grattan appeared as the champion of their rights the field was already in some degree prepared for his labors. Favored by such influences, of which no one knew better how to avail himself, he succeeded, 1780, in carrying, in the Irish parliament, the famous resolution, 'that the king's most excellent majesty, and the lords and commons of Ireland, are the only competent power to make laws to bind Ireland.' Many of the disqualifying statutes were now repealed, and the claim for complete equality with Englishmen and Protestants, or complete separation from the sister-country, was now formally urged. From this period till the final liberation was achieved there was no rest. The Irish rebellion of 1798 brought home to the English nation the dangers to which it would constantly be exposed till the question was finally adjusted. The Act of Union of 1800 was the immediate consequence of that outbreak; and to this act the Irish were induced to consent by a virtual pledge entered into by Mr. Pitt, to the effect that the Rom. Cath. disabilities should be at once removed. But, like William of Orange, Pitt had pledged himself to more than he was able to accomplish. The king was seized with scruples regarding the obligations imposed upon him by his coronation oath, and made a vigorous stand against the proposals of his minister.

At a subsequent period efforts were made in the direction of emancipation by Mr. Canning and Lord Castlereagh. About 1824, the press began to take up the question warmly; a Rom. Cath. Assoc. was formed to prepare petitions to parliament; the Irish priests stimulated their flocks to subscribe for the purposes of agitation; O'Connell rapidly became a power; and as early as 1825, March, the importance of the question was so deeply felt that Sir F. Burdett ventured to introduce a relief bill, which passed the commons by a majority of 268 to 241, but was rejected by the lords. A slight temporary reaction now took place, the superstitious fears of ignorant Protestants being excited by a 'no-popery' cry, and in consequence a new relief bill, introduced 1827, though supported by the last effort of Canning's eloquence, was lost in the commons by a majority of four. But the liberal view of the Rom. Cath. claims was essentially the popular one—at least among all but the least enlightened classes; and, as a proof of this, under the hostile administration of the Duke of Wellington, the very same resolution which had been lost in 1827 by a minority of four was carried in 1828 by a majority of six. The duke himself now began to waver in opinion, so that the beginning of the end was manifestly near. During O'Connell's famous canvass for the county of Clare the duke declared in the house of lords, 'if the public mind were now suffered to be tranquil, if the agitators of Ireland would only leave the public mind at rest, the people would become more satisfied, and I certainly think it would

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then be possible to do something.' O'Connell's return for Clare, notwithstanding the existence of the oaths which precluded him from taking his seat in the house, and the events which now followed in quick succession, made it clear that the 'something' of which the duke had spoken must be the passing of the emancipation bill in the ensuing session. The king's speech, read Feb. 5 of the following year, accordingly contained a recommendation to parliament to consider whether the civil disabilities of the Rom. Catholics could not be removed, 'consistently with the full and permanent security of our establishments in church and state.'

On Mar. 5, Mr. Peel brought forward the great measure. The majority on the motion in the commons for going into committee was 188, in a house of 508 members; the debate on the second reading issued in a majority of 180; and the final majority, after the bill had passed through committee, in which not one of the many amendments proposed was carried, was 178 in a house of 462. In the lords the debate lasted three nights, the majority being 106 in favor of the second reading of a bill which, nine months before, the same house had refused by a majority of 45, even to entertain—so rapid and threatening had been the progress of the agitation. This righteous measure became the law of the land 1829, Apr. 13. Its main provisions were as follows; For the oath of supremacy another oath was substituted, by which all Rom. Cath. members of parliament bound themselves to support the existing institutions of the state, and not to injure those of the church (see ABJURATION). Rom. Catholics were admitted to all corporate offices, and to an equal enjoyment of all municipal rights. The army and navy had already been opened to them. On the other hand, they were excluded from the offices of regent, of chancellor of England or Ireland, and of viceroy of Ireland; from all offices connected with the church, its universities and schools, and from all disposal of church patronage. The most important security related to the franchise, in which a £10 was substituted for a 40s. qualification in Ireland. The clergy of the Rom. Cath. Church were left in the position of other dissenters, the government having declined either to endow them or to introduce any machinery for prying into their relations to the pope. But the public use of their insignia of office, and of episcopal titles and names, was denied them; the extension of monachism was prohibited; and it was enacted that the number of Jesuits should not be increased, and that they should henceforth be subject to registration. The Ecclesiastical Titles Assumption Act (q.v.), the outcome of Protestant panic in 1854, has been since repealed, and the use of ecclesiastical insignia and episcopal titles and names is no longer denied to the Rom. Cath. Church in Britain. See Miss Martineau's *History of England during the Peace*.

CATHOLIC EPISTLES: name, according to Clemens Alexandrinus and Origen, of certain epistles in the New Test. addressed not to particular churches or individuals, but either to the church universal or to a large and indefinite circle of readers. Originally, the C. E. comprised

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only 1 John and 1 Peter, but at least as early as the 4th c. (by the testimony of Eusebius), the term was applied to all the apostolic writings used as 'lessons' in the orthodox Christian churches. But this included the epistle of James, of Jude, 2 Peter, and 2 and 3 John. These seven thus constituted the C. E., although the genuineness and authenticity of the last-mentioned five were not universally acknowledged; but this very incorporation with epistles whose canonicity was not questioned naturally had the effect of confirming their authority, so that in a short time the entire seven were acknowledged a portion of the canon.

CATHOLICOS, *ka-thōl'i-kōs*: title of the patriarchs or chief ecclesiastics in the hierarchy of the Armenian Church, and of the Christians of Georgia and Mingrelia.

CATHOLICS, **OLD**: see **OLD CATHOLICS**.

CATILINA, *kat-i-lī'na* (usually known as **CATILINE**), **LU'CIUS SER'GIUS**: B.C. abt. 108–62; of a patrician but impoverished family in Rome. During his youth he attached himself to the party of Sulla. His bodily constitution, which was capable of enduring any amount of labor, fatigue, and hardship, allied to a mind which could stoop to every baseness and feared no crime, fitted him to take the lead in the conspiracy which has made his name infamous to all ages. In B.C. 68 he was elected pretor; in B.C. 67 gov. of Africa; and in B.C. 66 he desired to stand for the consulship, but was disqualified on account of the accusations brought against him of maladministration in his province. Disappointed thus in his ambition, and burdened with many and heavy debts, he saw no hope for himself but in the chances of a political revolution, and therefore entered into a conspiracy, including many other young Roman nobles, in morals and circumstances greatly like himself. The plot, however, was revealed to Cicero by Fulvia, mistress of one of the conspirators. Operations were to commence with the assassination of Cicero in the Campus Martius, but the latter was kept aware of every step of the conspiracy, and contrived to frustrate the whole design. In the night of B.C. 63, Nov. 6, Catiline assembled his confederates, and explained to them a new plan for assassinating Cicero; for bringing up the Tuscan army (which he had seduced from its allegiance), under Manlius, from the encampment at Fæsulæ; for setting fire to Rome, and putting to death the hostile senators and citizens. In the course of a few hours, everything was made known to Cicero. Accordingly, when the chosen assassins came to the house of the consul, on pretense of a visit, they were immediately repulsed. On Nov. 8, Catiline audaciously appeared in the senate, when Cicero—who had received intelligence that the insurrection had already broken out in Etruria—commenced the celebrated invective beginning: *Quousque tandem abutère, Catilina, patientia nostra?* etc. (How long now, Catiline, will you abuse our patience?) The scoundrel was abashed, not by the keenness of Cicero's attack, but by the minute knowledge he displayed of the conspiracy. His attempt at a reply was miserable, and

was drowned in cries of execration. With curses on his lips, he abruptly left the senate, and escaped from Rome during the night. Catiline and Manlius were now denounced as traitors, and an army under the consul, Antonius, was sent against them. The conspirators who remained in Rome, chief of whom was Lentulus, were arrested, tried, condemned, and put to death, Dec. The insurrections in several parts of Italy were meanwhile suppressed; many who had resorted to Catiline's camp in Etruria deserted when they heard what had taken place in Rome, and his intention to proceed into Gaul was frustrated. In the beginning of Jan. (62) he returned by Pistoria (now Pistoja) into Etruria, where he encountered the forces under Antonius, and, after a desperate battle, in which he displayed almost superhuman courage and enthusiasm, was defeated and slain. The appearance of Catiline was in harmony with his character. He had a daring and reckless look; his face was haggard with a sense of crime; his eyes were wild and bloodshot, and his step unsteady, from nightly debauchery. The history of the Catiline conspiracy is given by Sallust in remarkably concise and nervous style.

CATINEAU-LAROCHE, *kă-te-nō' lá-rosh'*, PIERRE MARIE SÉBASTIEN: 1772, Mar. 25—1828, May 22; b. Saint-Brieuc, France. He studied at Poitiers, emigrated to San Domingo, 1791, and published at Port-au-Prince a paper, *L'ami de la paix et de l'union*. Giving offense by his anti-slavery opinions, he was prosecuted and narrowly escaped condemnation to death. Removing to Cape Haytien, then Cape Français, he was one of 17 Frenchmen saved from massacre. After visiting the United States and England, he returned to France, 1797, and prepared several lexicons. His printing office was burned and he entered the employ of govt., which sent him to Guiana, 1819, to examine its climate and resources; his notes thereon were published 1822.

CATION, n. *kă'tī-ōn* [Gr. *kata*, down; *īōn*, going]: an electro-positive substance which appears or is evolved at the cathode: see ANODE.

CATKIN, n. *kăt'kīn* [after the domestic *cat*, and *kīn*,



Catkin of Willow.

Catkin of Birch.

little: Dut. *katteken*, a little cat, a catkin: comp. Gael.

CATLIN—CATMINT.

caitean, the shag or nap of cloth; *caitin*, the blossom of the hazel, etc.]: same as AMENTUM (q.v.); in *botany*, a spike of numerous small, unisexual flowers, destitute of calyx and corolla, and furnished with scale-like bractæ instead, the whole inflorescence finally falling off by an articulation in a single piece. Examples are found in the willow, hazel, oak, birch, alder, and other trees and shrubs, forming the nat. ord. AMENTACEÆ (q.v.). In some, as in the oak and hazel, the male flowers only are in catkins.

CATLIN, *kăt-lîn*, GEORGE: 1796–1872, Dec. 23; b. Wilkesbarre, Penn.: artist and writer on Indians. He studied law in Conn., and practiced two years, but forsook it for art, and became a portrait painter in Philadelphia. Impressed by a delegation of Sioux, he conceived the idea of perpetuating the fast disappearing types, customs, and costumes of the Indians. Taking boat, 1832, at St. Louis for the Yellowstone, he spent eight years among some 48 tribes, learning their languages, studying their habits, and making copious notes, studies, and sketches. Returning by the Indian Territory, Arkansas, and Florida, he went to Europe, 1840, with his collection, which he exhibited in Egyptian hall, London, and published *Illustrations of the Manners, Customs, and Condition of the N. American Indians*, 2 vols., with above 300 engravings, London, 1841. The *Athenæum* called this ‘a unique work, a book of extraordinary interest and value, beyond all praise.’ It was followed by a *N. American Portfolio* (1844), 25 plates of hunting scenes, games, etc., in the Rocky Mountains and prairies. His *Eight Years’ Travels and Residence in Europe* (1848), tells the adventures of three parties of Indians whom he introduced to the courts of England, France, and Belgium. *The Breath of Life*, published 1861, in ‘manograph,’ sets forth the advantage of breathing through the nostrils and keeping the mouth closed, especially in sleep. *Last Rambles among the Indians of the Rocky Mountains and the Andes*, appeared 1868. His later years were spent mostly in Europe, till 1871; he died at Jersey City, N. J. His Indian gallery was acquired by govt., and placed in the Smithsonian Institution at Washington.

CATLING, n. *kăt’lîng* [see under CAT]: in *OE.*, catgut; the kind of string for fiddles.

CATLINITE, n. *kăt’lîn-îť* [after *Catlin*, the Amer. traveller]: a reddish variety of claystone found west of the Mississippi.

CATMANDOO: see KHATMANDU.

CATMINT, or CATNIP (*Nepeta cataria*): plant of the nat. ord. *Labiata*; widely diffused throughout Europe and the middle latitudes of Asia, and of North America; remarkable for the fondness which cats display for it. It appears to act upon them in a similar way to Valerian root; and when its leaves are bruised so as to be highly odoriferous, they are at once attracted to it, rub themselves on it, tear at it, and chew it. Its odor has been described as intermediate between that of mint and that of pennyroyal. It has erect stems, 2–3 ft. high, dense whorls of

CATO.

many whitish flowers, tinged and spotted with rose-color, and stalked, heart-shaped leaves of a velvety softness, whitish and downy beneath. Other species are numerous in the s. of Europe, and middle latitudes of Asia.

CATO, *kā'to*, DIONYSIUS: name prefixed to a little volume of moral precepts in verse, which was a great favorite during the middle ages. Whether such a person ever existed, is uncertain. The title which the book itself commonly bears is *Dionysii Catonis Disticha de Moribus ad Filium*. Its contents have been differently estimated; some scholars have considered the precepts admirable; others, weak and vapid; some have found indications of a superior scriptural knowledge; others, of a deep-rooted paganism. The style has been pronounced the purest Latin and the most corrupt jargon. The truth seems to be that, on a groundwork of excellent Latin of the silver age, the illiterate monks of a later period have inwoven a multitude of their own barbaric errors, which prevent a precise determination as to the period when the volume was composed. It begins with a preface addressed by the supposed author to his son, after which come 56 injunctions of rather a simple character, such as *parentem ama*. This is followed by the substance and main portion of the book—viz., 144 moral precepts, each expressed in two dactylic hexameters. During the middle ages the *Disticha* was used as a text-book for young scholars. In the 15th c. more than 30 editions were printed. The best edition, however, was published, Amsterdam 1754, by Otto Arntzenius; translated into English by Caxton.

CA'TO, MARCUS PORCIUS, surnamed *Censorius* and *Sapiens* ('the wise'), afterward known as CATO PRISCUS or CATO MAJOR—to distinguish him from Cato of Utica: B.C. 234–149; b. Tusculum, in ancient Latium, abt. 15 m. s. of Rome. He inherited from his plebeian father a small farm in the country of the Sabines, where he learned to love the simple and severe manners of his Roman forefathers, which still lingered round his rural home. Induced by Lucius Valerius Flaccus to remove to Rome when that city was in a transition epoch, from the old-fashioned strictness and severe frugality of social habits, to the luxury and licentiousness of Grecian manners, C. appeared to protest against this, to denounce the degeneracy of the Philo-hellenic party, and to set a pattern of sterner and purer character. He soon distinguished himself as a pleader at the bar of justice, and after passing through minor offices, was elected consul. In his province of Nearer Spain, where an insurrection had broken out after the departure of the elder Scipio (B.C. 206), C. was so successful in quelling disturbances and restoring order that in the following year he was honored by a triumph. C. showed extraordinary military genius in Spain; his stratagems were brilliant, his plans of battle were marked by great skill, and his general movements were rapid, bold, and unexpected. In B.C. 187, a fine opportunity occurred for the illustration of 'antique Roman' notions. M. Fulvius Nobilior had just returned from Ætolia victorious, and sought the honor of a triumph.

C. objected. Fulvius was indulgent to his soldiers, a man of literary taste, etc., and C. charges him, among other enormities, with 'keeping poets in his camp.' These rude prejudices of C. were not acceptable to the senate, and C.'s opposition was fruitless. In B.C. 184, C. was elected censor, and discharged so rigorously the duties of his office that the epithet *Censorius*, formerly applied to all persons in the same station, was made his permanent surname. Many of his acts were highly commendable. He repaired the water-courses, paved the reservoirs, cleansed the drains, raised the rents paid by the publicans for the farming of the taxes, and diminished the contract prices paid by the state to the undertakers of public works. More questionable reforms were those in regard to the price of slaves, dress, furniture, equipage, etc. His despotism in enforcing his *own* idea of decency may be illustrated from the fact that he degraded Manilius, a man of pretorian rank, for having kissed his wife in his daughter's presence in open day. C. was a thoroughly dogmatic moralist, intolerant, stoical, but *great*, because he manfully contended with rapidly-swelling evils; yet not *wise*, because he opposed with equal animosity the bad and the good in the innovations of his age.

In B.C. 175, C. was sent to Carthage to negotiate on the differences between the Carthaginians and the Numidian king Masinissa; but having been offended by the Carthaginians, he returned to Rome, where, ever afterward, he described Carthage as the most formidable rival of the empire, and concluded all his addresses in the senate-house—whatever the immediate subject might be—with the well-known words: '*Ceterum censeo, Carthaginem esse delendam*' ('For the rest, I vote that Cathage must be destroyed').

Though C. was acquainted with the Greek language and its literature, his severe principles led him to denounce the latter as injurious to national morals. C. was twice married. In his 80th year his second wife, Salonia, bore him a son, grandfather of Cato of Utica. C. treated his slaves with shocking harshness and cruelty. In his old age he became greedy of gain, yet never once allowed his avarice to interfere with his honesty as a state functionary. He composed various literary works, such as *De Re Rustica* (a treatise on agriculture)—much corrupted, however. The best editions are by Gesner and Schneider in *Scriptores Rei Rusticæ*. His greatest historical work, *Origines*, has unfortunately perished, but some few fragments are given in Krause's *Historicorum Romanorum Fragmenta* (Berlin, 1833). Fragments of C.'s orations—of which as many as 150 were read by Cicero—are given in Meyer's *Oratorum Romanorum Fragmenta* (Zurich, 1842).

CATO, MARCUS PORCIUS, named CATO THE YOUNGER, or CATO UTICENSIS (from the place of his death): B.C. 95–46, Apr.; great-grandson of Cato Major. Having lost, during childhood, both parents, he was educated in the house of his uncle M. Livius Drusus, and, even in his boyhood, showed decision and strength of character. In B.C. 72 he served with distinction in the campaign against Spartacus, but found no satisfaction in military life,

CATOCATHARTIC—CAT-O'-NINE-TAILS.

though he proved himself a good soldier. From Macedonia, where he was military tribune in 67, he went to Pergamus in search of the Stoic philosopher, Athenodorus, whom he brought back to his camp, and whom he induced to proceed with him to Rome, where he spent the time partly in philosophical studies, partly in forensic discussions. Desirous of honestly qualifying himself for the questorship, he commenced to study all the financial questions connected with it. Immediately after his election he introduced, in spite of violent opposition from those interested, a rigorous reform into the treasury offices. He quitted the questorship at the appointed time amid general applause. In B.C. 63, he was elected tribune, and also delivered his famous speech on the Catiline conspiracy, in which he denounced Cæsar as an accomplice of that political desperado, and determined the sentence of the senate. Strongly dreading the influence of unbridled greatness, and not discerning that an imperial genius—like that of Cæsar—was the only thing that could remedy the evils of that overgrown monster, the Roman republic, he commenced a career of what seems to us blind pragmatism in opposition to the three most powerful men in Rome—Crassus, Pompey, and Cæsar. C. was a noble but strait-laced *theorist*, who lacked the intuition into circumstances which belongs to men like Cæsar and Cromwell. His first opposition to Pompey was successful; but his opposition to Cæsar's consulate for the year 59 not only failed, but even served to hasten the formation of the first triumvirate between Cæsar, Pompey, and Crassus. He was afterward forced to side with Pompey, who had receded from his connection with Cæsar, and become reconciled to the aristocracy. After the battle of Pharsalia (B.C. 48), C. intended to join Pompey, but, hearing the news of his death, escaped into Africa, where he was elected commander by the partisans of Pompey, but resigned the post in favor of Metellus Scipio, and undertook the defense of Utica. Here, when he had tidings of Cæsar's decisive victory over Scipio at Thapsus (B.C. 46, Apr. 6), C., finding that his troops were wholly intimidated, advised the Roman senators and knights to escape from Utica and make terms with the victor, but prohibited all intercessions in his own favor. He resolved to die rather than surrender, and, after spending the night in reading Plato's *Phædo*, committed suicide by stabbing himself in the breast.

CATOCATHARTIC, a. *kăt-o-kăth-âr'tik* [Gr. *kato*, downward; *kathartikos*, purifying]: purging by causing evacuation by stool.

CATODON—CATODON'TIDÆ: see CACHALOT.

CATONIAN, a. *kā-tō'nī ān*: severe and inflexible, like the ancient Roman *Cato*. A CATO, *kā'tō*, a man of simple life, austere manners, and severe morals.

CAT-O'-NINE-TAILS [Pol. *kat*, executioner; *kota woti*, to scourge or torture: Russ. *koshka*, a cat; *koshki*, a whip of several cords]: nine strips of leather or cord knotted at intervals, used to flog offenders and criminals: see FLOGGING.

CATOPTRICS.

CATOPTRICS, n. plu. *kă-tŏp'trîks* [Gr. *katop'trîkos*, pertaining to a mirror—from *katop'tron*, a mirror—from *kata*, down or against; *optōmai*, I see]: that part of the science of optics which treats of the properties of light reflected from polished bodies. CATOP'TRON, n. *-trŏn*, an optical glass or instrument. CATOP'TRIC, a. *-trîk*, or CATOP'TRICAL, a. *-trî-kāl*, pertaining to. For the divisions of the science of optics, see OPTICS. Catoptrics is a subdivision of geometrical optics. All bodies reflect more or less light, even those through which it is most readily transmissible; light falling on such media, for instance, at a certain angle, is totally reflected. Rough surfaces scatter or disperse (see DISPERSION OF LIGHT) a large portion of what falls on them, through which it is that their peculiarities of figure, color, etc., are seen by eyes in a variety of positions; they are not said to *reflect* light, but there is no doubt that they do, though in such a way, owing to their inequalities, as never to present the proper phenomena of reflection. The surfaces with which C., accordingly, deals are the smooth and polished. It tracks the course of *rays* and *pencils* of light after reflection from such surfaces, and determines the positions, and traces the forms, of images of objects as seen in mirrors of different kinds.

A ray of light is the smallest conceivable portion of a stream of light, and is represented by the line of its path, always a straight line. A pencil of light is an assemblage of rays constituting either a cylindrical or conical stream. A stream of light is called a converging pencil when the rays converge to the vertex of the cone, called a focus; and a diverging pencil, when they diverge from the vertex. The axis of the cone in each case is called the axis of the pencil. When the stream consists of parallel rays the pencil is called cylindrical, and the axis of the cylinder is the axis of the pencil. In nature all pencils of light are primarily diverging—every point of a luminous body throwing off light in a conical stream; converging rays, however, are continually produced in optical instruments, and when light diverges from a very distant body, such as a fixed star, the rays from it falling on any small body, such as a reflector in a telescope, may, without appreciable error, be regarded as forming a cylindrical pencil. When a ray falls upon any surface, the angle which it makes with the normal to the surface at the point of incidence is called *the angle of incidence*; and that which the reflected ray makes with the normal is called *the angle of reflection*.

Two facts of observation form the groundwork of catoptrics. They are expressed in what are called the laws of reflection of light: 1. In the reflection of light, the incident ray, the normal to the surface at the point of incidence, and the reflected ray, lie all in one plane. 2. The angle of reflection is equal to the angle of incidence. These laws are simple facts of observation and experiment, easily verified experimentally. Rays of all colors and qualities follow these laws, so that white light, after reflection, remains undecomposed. The laws, too, hold, whatever be the nature, geometrically, of

CATOPTRICS.

and form of the image of an object placed before a plane mirror—as in fig. 3, where the object is the arrow AB , in the plane of the paper, to which the plane of the mirror is perpendicular—should be of the same form and magnitude as the object (as ab in the fig.), and at an equal distance from the mirror, on the opposite side of it, but with its different parts inverted with regard to a given direction. The highest point a , for instance, in the image, corresponds with the lowest point, A , in the object. It is evident also how, in the ordinary use of a looking-glass, the right hand of the image corresponds to the left hand of the object.

When two plane mirrors are placed with their reflecting surfaces toward each other, and parallel, they form the experiment called the endless gallery. Let (in fig. 4) the arrow, Q , be placed vertically between the parallel mir-

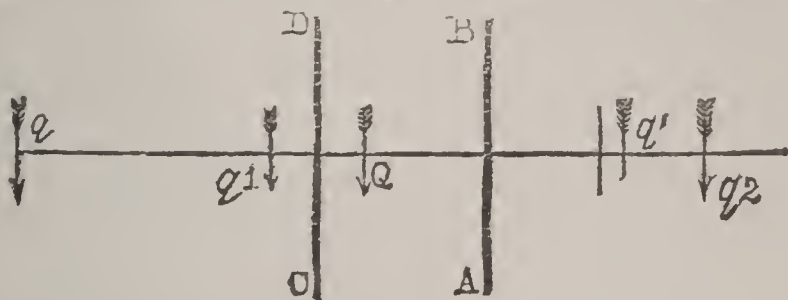


Fig. 4.

rors, CD , BA , with their faces turned to one another, Q will produce in the mirror CD the image q^1 . This image will act as a new object to produce with the mirror BA the image q^2 , which, again, will produce with the mirror CD another image, and so on. Another series of images, such as q' , q'' , etc., will similarly be produced at the same time, the first of the series being q' , the image of Q in the mirror BA . By an eye placed between the mirrors the succession of images will be seen as described; and if the mirrors were perfectly plane and parallel, and reflected all the light incident on them, the number of the images of both series would be infinite. If, instead of being parallel, the mirrors

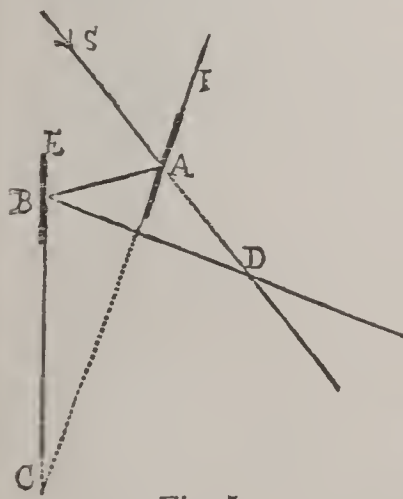


Fig. 5.

are inclined at an angle, the form and position of the image of an object may be found in precisely the same way as in the former case, the image formed with the first mirror being regarded as a new (virtual) object, whose image, with regard to the second, has to be determined. For a curious application of two plane mirrors meeting and inclined at an angle an aliquot part of 180° , see **KALEIDOSCOPE.—3.** The two propositions already established are of extensive application, as has partly been shown. They

include the explanation of all phenomena of light related to plane mirrors. The third proposition is one also of considerable utility, though not fundamental. It is: When a ray of light has been reflected at each of two mirrors

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inclined at a given angle to each other, in a plane perpendicular to their intersection, the reflected ray will deviate from its original course by an angle double the angle of inclination of the mirrors. Let A and B (fig. 5) be sections of the mirrors in a plane perpendicular to their intersection, and let their directions be produced till they meet in C. Let SA, in the plane of A and B, be the ray incident on the first mirror at A, and let AB be the line in which it is thence reflected to B. After reflection at B, it will pass in the line BD, meeting SA, its original path, produced in D. The angle ADB evidently measures its deviation from its original course, and this angle is readily shown to be double of the angle at C, which is that of the inclination of the mirrors. It is on this proposition that the important mathematical instruments called the quadrant and sextant (q.v.) depend.

Curved Surfaces.—As when a pencil of light is reflected by a curved mirror, each ray follows the ordinary law of reflection, in every case in which we can draw the normals for the different points of the surface, we can determine the direction in which the various rays of the pencil are reflected, as in the case of plane mirrors. It so happens that normals can be easily drawn only in the case of the sphere, and of a few 'surfaces of revolution,' as they are called. These are the paraboloid, the ellipsoid, and the hyperboloid of revolution. The paraboloid of revolution is of importance in optics, as it is used in some specula for telescopes: see SPECULUM: TELESCOPE. The three surfaces last named are, however, all of them interesting, as being for pencils of light incident in certain ways what are called surfaces of accurate reflection—i.e., they reflect all the rays of the incident pencil to a single point or focus. The following explains to what this property is owing in the case of the parabolic reflector, and states generally the facts regarding the other two.

1. The concave parabolic reflector is a surface of accurate reflection for pencils of rays parallel to the axis or central line of figure of the paraboloid. This results from the property of the surface, that the normal at any point of it passes through the axis, and bisects the angle between a line through that point, parallel to the axis, and a line joining the point to the focus of the generating parabola. Referring to fig. 6, suppose a ray incident on the surface at P, in the line SP, parallel to the axis AFG. Then if F

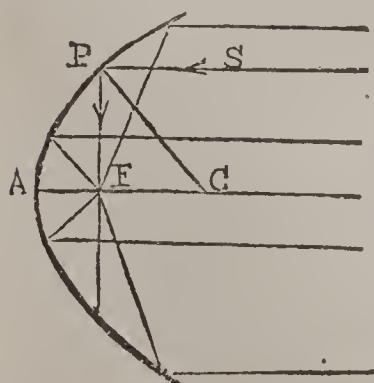


Fig. 6.

be the focus of the generating parabola, join PF. PF is the direction of the reflected ray. For PG, the normal at P, by the property of the surface, bisects the angle FPS, and therefore $\angle FPG = \angle GPS$. But SPG is the angle of incidence, and SP, PG, and FP are in one plane, and therefore, by the laws of reflection, FP is the reflected ray. In the same way all rays whatever, parallel to the axis, must pass through F after re-

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flection. If F were a luminous point the rays from it after reflection on the mirror, would all proceed in a cylindrical pencil parallel to the axis. This reflector, with a bright light in its focus, is accordingly of common use in light-houses.

2. In the concave ellipsoid mirror there are two points—viz., the foci of the generating ellipse—such that rays diverging from either will be accurately reflected to the other. This results from the property of the figure, that the normal at any point bisects the angle included between lines drawn to that point from the foci.

3. Owing to a property of the surface similar to that of the ellipsoid, a pencil of rays converging to the exterior focus of a hyperbolic reflector, will be accurately reflected to the focus of the generating hyperbola.

The converse of the above three propositions holds concerning mirrors that are convex.

Though the sphere is not a surface of accurate reflection, except for rays diverging from the centre, and which on reflection are returned thereto, the spherical reflector is of great practical importance, because it can be made with greater facility and at less expense than the parabolic reflector: see TELESCOPE. It is necessary, then, to investigate the phenomena of light reflected from it.

4. *Spherical Mirrors.*—It is usual to treat of two cases, the one the more frequent in practice, the other the more general and comprehensive in theory. First, then, to find the focus of reflected rays when a small pencil of parallel rays

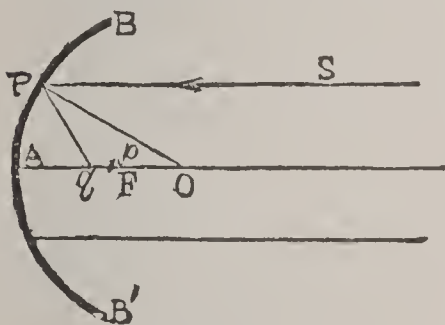


Fig. 7.

is incident directly on a concave spherical mirror. Let BAB' (fig. 7) be a section of the mirror, O its centre of curvature, and A the centre of its aperture. AO is the axis of the mirror, and therefore of the incident pencil, because it is incident directly on the mirror, a pencil being called oblique when its axis is at an angle

to the axis of the mirror. As the ray incident in the line OA will be reflected back in the same line— OA being the normal at A —the focus of reflected rays must be in OA . Let SP be one of the rays; it will be reflected so that $\angle POq = \angle SPO$. But $\angle POq = \angle OPS$ by parallel lines. Therefore, $\angle qPO = \angle qOP$, and Pq and Oq are equal. If, now, the incident pencil be very small—i.e., if P be very near A —then the line Pq will very nearly coincide with the line OA , and Pq and Oq will each of them become very nearly the half of OA . Let F be the middle point of OA —the point, namely, to which q tends as the pencil diminishes. Then F is called the principal focus of the mirror, and AF the principal focal length, which is thus $= \frac{1}{2}$ radius of the mirror. It will be observed that when AP is not small, q lies between A and F . Fq is called the aberration of the ray. When AP is large, the reflected rays will continually intersect, and form a *lami-*

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nous curve with a cusp at F. This curve is called the caustic (q.v.). We shall now proceed to the more general case of a small pencil of diverging rays, incident directly on a concave spherical mirror. Let PAP' (fig. 8) be a section

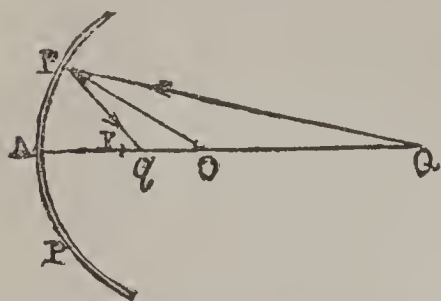


Fig. 8.

tion of the mirror, A the centre of its aperture, O of its curvature, and let F be its principal focus. Then, if Q be the focus of incident rays (as if proceeding from a candle there situated), q , the focus of the reflected rays, lies on QOA, since the pencil is incident directly, and the ray QOA, being incident in the line of the normal OA, is reflected back in the same line. Let PQ be any other ray of the pencil. It will be reflected in Pq, so that $\angle QPO = \angle OPQ$; and on the supposition that PA is very small, so that QP becomes nearly equal to QA, and qP to qA, it can be shown by Euclid, vi. 3, that $\frac{QO}{QA} = \frac{qO}{qA}$ very nearly. From this equation is deduced the formula $qA = \frac{QA \times AF}{QA - AF}$, which enables us to find qA, when QA and AF are known. Thus, let the radius of curvature be 12 inches, and the distance of the source of the rays, or QA, 30 inches, the focal length $qA = \frac{30 \times 6}{30 - 6} = 7\frac{1}{2}$ inches. If the rays had diverged from q , it is clear they would have been reflected to Q. The points Q and q , accordingly, are called conjugate foci.

If the mirror be convex, as in fig. 9, instead of concave, and a pencil of diverging rays be incident directly on it from Q, we should find, proceeding in exactly the same way as in the former case, the equation

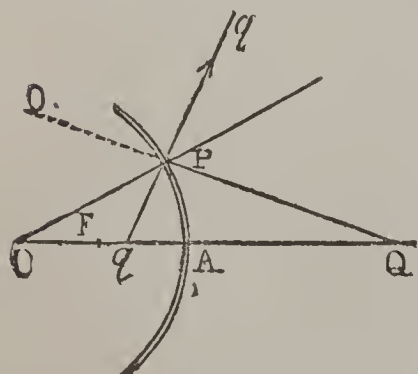


Fig. 9.

$qA = \frac{QA \times AF}{QA + AF}$; or taking the same numbers as before; $qA = \frac{30 \times 6}{30 + 6} = 5$ inches.

As to the formation of images by spherical mirrors, see Potter's

Elements of Optics: see also MIRRORS: IMAGES.

By considering fig. 8 it is easy to see how the relative positions of the two conjugate foci, as they are called, Q and q , vary as the distance, AQ, of the origin of the rays is changed. As Q is advanced toward O, q also approaches O, since the angles QPO and qPO always remain equal; and when the source of the light is in the centre, O, of the sphere the reflected rays are all returned upon the source. As Q, again, recedes from O, q moves toward F, which it does not quite reach until the distance of Q is infinite, so

CATOPTROMANCY—CATSKILL.

that the incident rays may be considered as parallel, as in fig 7. If Q is placed between O and F, then *q* will be to the right of O; and when Q coincides with F, the reflected rays will have no focus, but will be parallel. If Q is between F and A, the reflected rays will diverge, and will have their virtual focus to the left of A. The correctness of these deductions may easily be verified. The positions of the conjugates are traced in precisely the same way for the convex mirror, and any one may trace them without difficulty.

CATOPTROMANCY, *ka-tŏp'tro-măn-sĭ*: divination by the mirror or looking-glass. At Patras, in Greece, the sick foretold their death or recovery by means of a mirror let down with a thread until its base touched the water in a fountain before the temple of Ceres. The face of the sick person appearing healthy in the mirror, betokened recovery; if it looked ghastly, then death was sure to ensue. More modern superstitions attach ill-luck to the breaking of a looking-glass, and to seeing one's face in a glass by candle-light.

CATS, *kăts*, JACOB: 1577-1660; b. Brouwershaven, in Zeeland: Dutch statesman and poet. He studied law, settled at Middelburg, rose to high offices in the state, and was twice sent as ambassador to England, first in 1627, and again in 1652 while Cromwell was at the head of affairs. As a poet, he had high popularity. His poems are characterized by simplicity, rich fancy, clearness, and purity of style, and excellent moral tendency. The most highly prized were the *Huwelyk, Trouwringh* (a series of romantic stories relating to remarkable marriages), and the *Spiegel van den Ouden en Nieuwen Tyd*. The best edition of his works appeared at Amsterdam, 19 vols., 1790-1800.

CAT'S-EYE: beautiful mineral, a variety of quartz receiving its name from the resemblance which the reflection of light from it, especially when cut *en cabochon*, or in a convex form, shows to the light which seems to emanate from the interior of the eye of a cat. It is of various colors, and has a sort of pearly appearance, and is *chatoyant* or characterized by a fine play of light, which results from the parallel arrangement of the minute fibres of the stone itself, or from an intimate mixture of some foreign substance, such as amianthus. It has been supposed that C. is silicified wood. It is obtained chiefly from Malabar and Ceylon. The Singhalese are especially proud of it, believing it, although erroneously, to be found only in their island. It is often brought thence, cut to resemble a monkey's face, from the idolatrous regard entertained for the monkey. A chatoyant variety of felspar, also found in Ceylon, has been sometimes confounded with cat's-eye.

CATSKILL, *kăts'kĭl*: capital of Greene co., N. Y., on the w. bank of the Hudson, at the mouth of C. creek; 34 m. s. of Albany, and 109 m. n. of New York; on the West Shore railroad, and connected by ferry with the Hudson river railroad. The village has the co. buildings, 7 churches, 2 banks, 2 newspapers, and some factories. It is important

CATSKILL GROUP—CATTARO.

as the main (and till recently the only convenient) entrance to the C. mountains. Pop. (1870) 3,791; (1880) 4,320; (1890) 4,920; (1900) 5,484.

CATSKILL GROUP, in Geology: uppermost division of the Devonian system in America, best exemplified in Bradford, Tioga, Potter, and other n. cos. of Penn. These rocks are chiefly red sandstone and shale, containing the fossilized bones and scales of large ganoid fishes. The name was taken from the C. mountains, which were formerly believed to be composed of these rocks, but are now known to be chiefly strata of the Chemung group.

CATSKILL MOUNTAINS (formerly KAATSKILL): group of the Alleghany chain in its largest sense, near the right bank of the Hudson and of the Mohawk, in N. Y., chiefly in Greene co. They do not form a symmetrical and extended range like those of the Appalachians in Penn., but, branch w. in spurs, with precipitous slopes to the e., and elevated peaks, of which Hunter Mountain is 4,050 ft. high, and Overlook 3,800; after these are Round Top and High Peak. N. and w., on the borders of Schoharie co. and Delaware co., and s. in Ulster co. (except Overlook Mountain), the altitudes are not so great, and the slopes gentler. The value of this region is in the fine scenery that it offers within a few hours of the metropolis; in summer it is crowded with seekers after health, pleasure, and the picturesque. On old Pine Orchard, a level spot ending in a precipice 12 m. from C. village and 2,235 ft. above the Hudson, the Mountain House has stood for 60 years: 2 m. w. of it are the Kaaterskill falls, three cascades of 180, 80, and 40 ft. in succession. The land w. of this is partly cultivated, and nearly every farm holds a boarding-house. The Overlook House, not far to the s., was built abt. 1873 at an elevation of 3,000 ft. Till a few years ago the mountains were reached only by stages; now the C. Mountain railroad carries passengers in the season from C. village to Cairo and Palenville, the latter at the foot of the Kaaterskill Clove; and the Ulster and Delaware railroad, of greater length, starting from Rondout, skirts the mountains on the w., while its Stony Clove branch ascends to Hunter, Tannersville, and nearly to the Mountain House. The Kaaterskill and Plattekill Cloves, as well as the summit views, are probably unsurpassed for beauty in the n.e. states, except by the Adirondack and White Mountains. The region is still heavily wooded, with oak, maple, beech, birch, pine, hemlock, ash, cedar, and other trees.

CATS'-TAIL: see *TYPHA*.

CATS'-TAIL GRASS: see *TIMOTHY GRASS*.

CATSUP, n. *kăt'sŭp*: for *CATCHUP*, which see.

CATTACK: see *CUTTACK*.

CATTARO, *kăt'tâ-rô*: town of Austria, in the crown-land of Dalmatia; at the head of the Gulf of C., about 36 m. s.e. of Ragusa; strongly fortified, and surrounded on all sides by mountains. The castle, massive and almost inaccessible, stands on a precipitous rock immediately behind the town. C. has a cathedral, several churches, and



Cattle.—Hereford Bull and Cow.



Cattle.—Polled Aberdeen-Angus Bull and Cow.



Cattle.—Galloway Bull.



Cattle.—West Highland Cow.



Cattle.—Jersey Cow.

CATTARO—CATTLE.

hospitals. It was at one time cap. of a small republic; was in 1807 annexed to the kingdom of Italy, but was transferred to Austria, 1814, by the treaty of Vienna. Pop. 3,000.

CATTARO, GULF OF, or BOCCA DI CATTARO: inlet of the Adriatic, near the s. extremity of the Dalmatian coast. It consists of three basins or lakes, connected by straits of about half a mile in breadth. The outer entrance is only a mile and a half wide, and the total length of the gulf is about 30 m. Mountains protect it from all winds, and it has a depth of from 15 to 20 fathoms.

CATTEGAT, or KATTEGAT, *kät'tê-găt* (*Sinus Codanus*): bay or arm of the sea between the e. coast of Jütland and the w. coast of Sweden, n. of the Danish islands. It is connected with the Baltic Sea by the Great and Little Belt (q.v.), and by the sound. The Skager Raek (q.v.) connects it with the North Sea. The length of the C. is about 150 m., greatest breadth 85 m. It is of unequal depth, and has dangerous sand-banks. The principal islands are Lasøe, Samsøe, and Anhalt. The Danish shores of the C. are low, but the Swedish shore is very steep and rocky.

CATTERMOLE, *kät'er-möl*, GEORGE: 1800–1868, July 24; b. Dickleburgh, Norfolk: distinguished English painter in water-colors. His pictures, which embrace a wide range of subjects, are remarkable for originality of conception, vigorous execution, and fine color and tone. One of his best known and greatest pictures is *Luther at the Diet of Spires*, containing 33 portraits of the principal characters, copied from the authentic originals by old masters. He also designed the engravings for his brother's *History of the Civil Wars*, and illustrated many scenes in Scott's novels and in Shakespeare. His later works are chiefly oil paintings.

CATTI, or CHATTI, *kät'tê*: German people, included by Cæsar under the name Suevi (q.v.), who inhabited a country nearly corresponding to the present Hesse. The s.w. part of their territory, around *Mattiacum*, was conquered by the Romans under Drusus. The C. took part in the general rising of the Germans under Hermann. Tacitus praises them as excellent foot-soldiers. During the reign of Marcus Aurelius, in the end of the 2d c., they made incursions into Roman Germany and Rhætia. Caracalla failed in an expedition against them and the Aleman-ni in the 3d c. About the middle of that c., their name began to give place to that of the Franks (q.v.), and is last mentioned by Claudian late in the 4th century.

CATTLE, n. *kät'tl* [OF. *catel* or *chatel*, goods, movables—from mid. L. *catal'la*, chattels, goods in general—specially applied to cattle as the principal wealth in an early stage of society—from mid. L. *capitilē* or *capitālē*, capital, property—from L. *capitālis*, pertaining to the head, capital—from L. *caput*, the head—*lit.*, movable property in general]: quadrupeds, being domestic animals used for labor or for food—more especially applied to oxen, bulls, and cows (see Ox). CATTLE-SHOW, n. an exhibition of domestic animals in competition for prizes. CATTLE-PEN, n. pen for cattle.

CATTLE, in Law: see CHATTEL,

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CATTLE-PLAGUE: general name for disease attacking cattle, and sometimes sheep and allied species. The diseases thus termed are very various.

RINDERPEST [Ger.], or **STEPPE-MURRAIN**: contagious eruptive fever, or exanthema, affecting the bovine species; sheep, goats, deer, and other allied species occasionally, however, catch it from cattle. It occurs indigenously on the plains of w. Russia, whence it has at various times overspread most parts of the old world. There is good authority for saying that it has never yet appeared in the United States, though some allied diseases have wrought much havoc. The specific virus from diseased or infected animals is the only known source of rinderpest; no filth, overcrowding, or other health-depressing cause has hitherto produced it. As in small pox, scarlatina, and other eruptive fevers, an incubative stage, varying between two and twenty days, intervenes between the introduction of the virus into the system, either by inoculation or contagion, and the development of the characteristic symptoms. These consist essentially of congestion of the mucous and cutaneous surfaces, with a sort of aphthous eruption, and thickening, softening, and desquamation of the superficial investing membrane. The disease runs a measurably fixed and definite course, which is not materially altered by any known remedial measures. It seldom attacks the same individual a second time.

History.—The rinderpest has been recognized for upward of a thousand years. It appears to have destroyed the herds of the warlike tribes who overran the Roman empire in the 4th and 5th c. About 810, it travelled with the armies of Charlemagne into France, and about the same period is supposed also to have visited England. Several times through the course of every century it spread from the plains of Russia over the w. of Europe, and is stated to have again visited England about 1225. Although occasioning, every few years, great losses on the continent, the C. P. is not recorded as showing itself again in England until 1714, when it appeared at Islington about the middle of July, was very destructive for about three months, but ceased toward Christmas. In 1744, it was in Holland, destroying there, in two years, 200,000 cattle; in Denmark, 1745–49, it killed 280,000; in some provinces of Sweden it spared only 2 per cent. of the horned cattle. It made terrible havoc throughout Italy, destroying 400,000 beasts in Piedmont alone. In 1745, Apr., the C. P. was again imported into England, probably by some white calves from Holland, where it had for some time prevailed. It continued its devastations for 12 years, but it is now impossible accurately to discover the losses that it occasioned. In the third and fourth years of its ravages, 80,000 cattle were slaughtered, and double that number are supposed to have died. In 1747, 40,000 cattle died in Nottingham and Lancashire alone; while, so late as 1757, 30,000 perished in Cheshire in six months. In 1770, March, the disease was brought with some hay from Holland to Portsoy, in the Moray Firth; several cattle died, and others, to the value

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of abt. £800, being destroyed, the further spread of the pest was prevented. By the wars which wasted Europe toward the close of the last c. and in the first 18 years of the present c., C. P. was spread widely over the continent, and occasioned terrible losses. Since then, at short intervals, it has spread—always traceable to its source on the Russian plains—over Poland, Hungary, Austria, Prussia, portions of Germany and Italy, and has extended to Egypt. It has reached also China and Japan.

The British outbreak of 1865-67, like its predecessors, came undoubtedly from Russia. The steamer *Tonning* from Revel, brought 331 cattle and 330 sheep into Hull, 1865, May 29. A portion of the cattle had come from the interior of Russia, where the plague then was, or recently had been; the cargo was rapidly landed, and very hurriedly inspected. Nearly half of the cattle were distributed in various lots to butchers in Leeds, Derby, and Manchester, but, curiously, these do not appear to have left any contagion in their trail. 175 came to London, remained from the Monday evening until Thursday's market in lairs at York Road, adjoining the cattle-market. It was stated, in a leader in the *Times*, Aug. 15, that rinderpest was seen in the metropolitan market as early as June 12. Certain it is that more than one lot purchased June 19 carried the disease to several dairies in and about London. The first cases were mistaken for cases of poisoning; the cows they had stood beside were sent into market, and thus the subtle disorder in a few weeks spread into many dairies in town and country. 23 Dutch cattle, having stood over for several markets, were sent back to Holland July 2, carried with them the contagion, were placed in a field near Schiedam, but soon sickened and died, thus spreading the disease in Holland. During the next six months, plague was repeatedly re-imported thence into England. Until 1865, Aug. 11, no restrictions whatever were put upon the removal of cattle; diseased and infected animals were freely taken to fairs and markets, were openly transported by road and rail; while the metropolitan market continued every week to send forth infected cases, not only to the neighboring counties, but to Southampton, Birmingham, Hereford, Liverpool, Edinburgh, and even to Aberdeenshire. As early as July 18, the pest was brought from London to Huntly by four calves; subsequent outbreaks occurred in the same way. The stamping-out system was, however, early and rigidly enforced in Aberdeenshire, and eight distinct outbreaks were promptly suppressed.

In Edinburgh, it appeared probably about Aug. 9, was brought from London by some low-priced foreign cows; in six weeks, about 800, or one half the dairy cows in Edinburgh, had died—200 having been buried in one trench. By the end of Jan., four fifths of the dairy cows had perished, but Edinburgh was reported clear of the disease. In Glasgow, the first case occurred Aug. 19, in a cow sent from Edinburgh. By Sep. 30, 432 cases were reported, and it continued to spread. By the middle of Oct., it was in Mr. Harvey's valuable stock of 800, of which 25 died in

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one night, and to save further loss, 50 healthy animals were in one day disposed of to the butcher. From Falkirk Trysts, as from Barnet, Norwich Hill, and other large English fairs, the disease was transmitted to fresh localities. From the autumn trysts, it was carried into Perthshire, Forfarshire, and Fifeshire. Diseased cattle passing along in railway cars, appear to have spread the contagion over the fields adjoining the line at Thornton, Fifeshire. Into West Lothian it was conveyed early in Sep. by lambs from the Edinburgh market.

The rapid spread of the insidious disorder may be gathered from the fact that, while, during the week ending 1865, June 24, there was only one outbreak at Mrs. Nicholl's dairy at Islington, and 30 animals affected, by Sep. 30 there were 1,702 farms, sheds, or other places in which the pest had appeared, and 13,263 animals had been attacked. Three months later, 8,252 separate places had been visited and 62,743 animals attacked. During six months the aggregate of cattle attacked was 76,002. During the three months to Mar. 30, 13,443 farms and other premises had been infected and 147,275 cattle attacked. In 1865, Dec., the fresh cases each week reached 9,000; but in spite of remedial and preventive measures, of orders in council, and restrictions on the movement of stock, the number of weekly cases steadily increased to 15,706 in the third week of Feb. The effect of 'the Cattle Diseases Prevention Act' passed 1866, Feb. 20, and the advantages of the restrictions thus tardily imposed on the trade in cattle, and the slaughter of diseased and infected animals, were speedily apparent. In four weeks, the number of cases was reduced by one half. During the three months ending June 30, 28,276 cases were reported; during the next three months to Sep. 30, the numbers fell to 2,108, while, to Dec. 29, the three months' cases were but 149; to 1867. Mar. 30, 89 new cases were noted. Through April and May the number of cases continued steadily to decline; but during the week ending May 25 a fresh outbreak occurred in the Finsbury district of the metropolis, and 81 animals died, or were slaughtered to prevent the further spread of the pest. With the exception of an isolated outbreak in Essex, promptly stayed by slaughter of the ailing and suspected animals, the country was free of plague during Aug. The following are the records of its destructive career 1865-67:

	Attacked.	Killed.	Died.	Recovered.
England	223,672	102,740	90,450	21,589
Wales	8,388	1,180	5,794	1,117
Scotland.....	46,863	6,263	28,088	10,707
Total	278,923	110,183	124,332	33,413

To this total must be added 11,000 cases known to have been attacked and unaccounted for, and upward of 60,000 healthy cattle slaughtered to prevent the spread of the disease. Plague was again imported into Hull, 1872, Aug.; it was brought with cattle from Cronstadt; it spread into

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several districts of the East Riding, attacked 72 animals, 51 of which were killed, and 21 died. In 1877, an outbreak took place in Germany, but by energetic measures was speedily suppressed without extensive losses.

Causes.—The theory of development of cattle plague (rinderpest) by filth, overcrowding, miasmata, hot weather, or other such causes, is untenable. Faulty hygiene, by lowering vitality, probably renders the animal more prone to the attack, and less able to bear up against it, but it cannot originate C. P. Like hydrophobia, small-pox, or syphilis, it is developed only by a special virus, whose habitat in this case seems to be the Russian steppes. This virus occurs abundantly in the blood of every plague-stricken beast, in the discharges from its nostrils, mouth, or eyes, in the off-scourings from the bowels, probably even in the breath. It may be transferred to healthy beasts by inoculation. A little of the blood or nasal or other mucous discharges of a C. P. case, introduced underneath the skin of a healthy cow, develops the disease within a few days. The transference of the virus or contagion from the sick to the sound animal, is not always so direct and evident. As with other catching diseases, the virus may be carried considerable distances in the air; its particles are minute, but they have powerful vitality; it may adhere to the food that has lain before infected beasts; to the litter from the stalls, or even after it has been heaped for weeks; to the clothes of attendants; to the floors, walls, or stalling of buildings; to imperfectly cleansed cattle-trucks. So subtle and potent is the plague poison, and so endowed with the power of self multiplication and growth, that a very minute portion of it finding access to the blood of a healthy animal of the bovine race increases so rapidly, that, to use the words of the Commissioners' Report, No. III., p. 4, 'the whole mass of the blood, weighing many pounds, is infected; and every small particle of that blood contains enough poison to give the disease to another animal.' It may gain access to the blood probably through the air-passages; perhaps, also, by absorption through the mucous surface of the bowels, or even through the skin.

Symptoms.—In from three to six days after an animal has been exposed to the virus of rinderpest, or about 36 to 48 hours after being purposely inoculated, the temperature of the body is raised by several degrees. A delicate thermometer introduced into the vagina or rectum, instead of marking about 102° F., indicates 104° to 106°. As yet, the appetite, secretion of milk, breathing, and pulse are scarcely if at all affected, and but for the elevation of temperature, accompanied sometimes by dulness, the animal might be supposed to be in perfect health. Two or three days later, usually within six or eight days after the beast has taken in the subtle virus, the mucous membrane of the mouth is generally observed to be slightly reddened, and soon a granular yellowish-white eruption, consisting of thickened epithelium cells and granules, appears on the gums round the incisor teeth, and later on the lips and dental pad. Some hours later, the same eruption extends

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to the cheeks, tongue, and hard palate. Within 48 hours, or about the sixth day of attack, a crust of epithelium covers the gums, lips, and mouth, and when wiped away, or accidentally rubbed off, leaves the abraded membrane red and vascular, and exhibiting patches of erosion. The membrane lining the vagina indicates very similar appearances; it is reddened and vascular, dotted with grayish translucent, elevations about the size of rape-seeds, covered with a whitish-yellow, usually sticky discharge, and occasionally marked with patches of excoriation. The skin, like the mucous surface, is congested; there is hence a perverted development of scarf skin, and of the oleaginous secretion of the irritated sebaceous glands. The skin is thus invested with a furfuraceous desquamation; while on its thinner portions about the lips, between the thighs, and on the udder, there are papular eruptions or elevations. About two, or even three days after the temperature has been increased, and usually one, or even two days after the appearance of the characteristic eruption on the gums, the constitutional symptoms present themselves. The animal is dull, hangs its head, arches its back, the eyes are leaden and watery, and from both eyes and nose there latterly comes a dirty, slimy discharge. Appetite and rumination are irregular, and in dairy cows, the secretion of milk rapidly abates. The breathing, especially toward the sixth day, is oppressed, expiration is prolonged, and accompanied by a peculiar grunt. The pulse is small and thready, and quickened as death approaches. The bowels, usually at first confined, become, toward the sixth or seventh day, much relaxed; the discharges passed, often with pain and straining, are profuse and liquid, offensive, acrid, pale colored, and occasionally mixed with blood. The patient loses weight and strength, totters if it attempts to walk, and prefers to lie rather than to stand. Death usually occurs about the seventh day, and is preceded by muscular twitchings, a peculiar sickly, often offensive smell, a cold, clammy state of body, moaning, grinding of the teeth, and rapidly-increasing prostration.

Prognosis.—Cases usually terminate unfavorably when about the fifth or sixth day the animal temperature falls rapidly; the pulse becomes small, quick, and weak: the breathing more difficult, distressed, and moaning; the diarrhea increased; and the depression more notable. A more favorable termination may be anticipated when, after the fifth day, the heightened temperature, so notable even from the earliest stages, abates gradually; the breathing becomes easier; the pulse firmer; the visible mucous membranes appear healthier; and patches of extravasation, or erosion speedily disappear.

Sheep do not take rinderpest spontaneously, and even when kept with diseased cattle, or inoculated with cattle-plague virus, they do not catch the disease so certainly as cattle do. When diseased, they exhibit, however, very similar symptoms, but Professor Röhl, and other observers, record that upward of 40 per cent. recover. Goats, deer,

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antelopes, gazelles, yaks, and indeed all animals taking rinderpest, exhibit with considerable uniformity the same characteristic symptoms.

Post-mortem Appearances.—The mucous membranes are generally deeper colored than natural, are congested, softened, marked in places with the same granular patches discoverable during life within the mouth and vagina, and in bad cases exhibit œdema, hemorrhage, and sloughing. The first three stomachs sometimes contain a good deal of food, but show less declension from health than the fourth stomach, of which the mucous membrane is dotted with spots of congestion and extravasation. The coats of the bowels are thinned and easily torn. The mucous coat, especially toward the middle of the small intestines, the opening into the cæcum, and posterior half of rectum, is much congested, bared of epithelium, and sometimes ecchymosed, but never ulcerated. Peyer's glands, so generally inflamed in the somewhat analogous typhoid fever of man, are perfectly healthy. The liver, spleen, and pancreas seldom present any special appearances. The respiratory mucous membrane, like the digestive, is vascular, and marked with submucous hemorrhage; the lungs are generally emphysematous, the heart often marked with petechial spots. The urino-genital, like the other mucous membranes, is congested in females, especially toward the lower part of the vagina and vulva; the kidneys are sometimes rather softened; the serous membranes and nervous centres are perfectly unchanged. Dr. Beale, by his microscopical observations, discovers in the capillaries a great increase of nuclear or germinal matter, and white blood-corpuscles, which he believes may account for the local congestion. The blood itself is dark in color; in the later stages it contains less water, probably owing to the draining diarrhea, and about double its usual proportion of fibrine. The muscular tissues are softened, easily broken down, and contain an abnormal amount of soluble albumen. The urine is little altered in quantity, but from the first rise in the animal temperature, it contains an increase of urea varying from 5 to 15 per cent. The chief change in the milk is its rapid diminution in quantity, and the increase of its fatty matters. The bile is watery, offensive, and prone to decomposition.

Treatment.—Cattle-plague (rinderpest) is proved to be an eruptive fever. When the specific poison, on which such disorders depend, has entered the body of a susceptible subject, no remedy has yet been discovered which can destroy it, or even materially shorten or mitigate its effects. Until such an antidote is found, there can be no hope of certain cure. The British cattle-plague commissioners have collected information regarding the four following methods of treatment—namely, the antiphlogistic, the tonic and stimulant, the antiseptic, and the special. Diverse as are these systems, the percentages of recoveries, varying from 25·83 to 27·45, were so nearly alike, that it is fair to conclude that no one of the systems tried exercised any notable influence in checking the mortality. Partly, per-

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haps, from the varying virulence of the plague, partly from differences in the nursing and care bestowed on the animals, the proportion of recoveries has varied greatly in different localities. Up to the end of 1865, in Huntingdon they were only 4·668 per cent.; in Norfolk they were 12·102; in Flint, 15·909; in Scotland, 19·889; while in Fife-shire they reached 24·552; and in Yorkshire, 29·731 per cent.

Like small-pox, measles, and other eruptive fevers in man, rinderpest runs a definite course which cannot safely be interfered with. Rational treatment is therefore limited to warding off untoward symptoms, to careful nursing, and husbanding the failing strength. It must, however, be remembered that throughout the progress of the disease there is constantly given off from the sick body minute particles, which are capable of developing the disorder in healthy cattle. Hence plague-subjects, by the orders in council, are very properly required to be immediately destroyed. Except, therefore, for purely scientific purposes, and with careful precautions to prevent the spread of the poison, it is unwise to attempt remedial treatment. Where, however, a beast is to have a chance of recovery, so soon as the elevated temperature indicates the accession of the disease, solid indigestible food should be withheld, and the patient restricted to mashes, gruel, boiled linseed, malt, and other food, which can be digested without the necessity for rumination. The paramount importance of such a dietary is clearly demonstrated in the returns of the Edinburgh cattle-plague committee to the government commissioners. The recoveries among 310 cattle, 'fed with dry food, and treated medicinally with drugs,' were 13·6. Among 303 cattle treated with mixed food and hay 22·2 recovered. Where mashes were given during sickness, but dry food supplied during convalescence, the recoveries reached 51·5; while in 95 cottagers' cows, whose chief ordinary dietary consisted of mashed food, and which were fed in the same manner throughout both sickness and convalescence, and were besides carefully nursed but not doctored, the recoveries reached 73·7. Where the bowels at the outset are costive a dose of oil, or a very small quantity of some saline purgative, may be required. Cold water, gruel, mashes, or stale bread soaked either in water or beer, should be offered at short intervals throughout the attack. The animal, kept in an atmosphere of about 60°, should be comfortably clothed and have its legs bandaged. The hot-air bath and wet-packing has been repeatedly tried, but although probably useful in the earlier stages, appear, when the disease is fully established, to harass and weaken the patient. Small and repeated doses of sulphite of soda have in some cases proved useful, and may be conjoined with carefully regulated moderate doses of such stimulants as ale, whisky, and water, sweet spirits of nitre, spirit of ammonia, or strong coffee. It is most important, however, that these and other such medicines should be drunk by the animal of its own accord in its gruel, water, or mashes, as the forcible horn-ing over of drenches always disturbs the patient. The in-

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halation of chloroform, although temporarily relieving the distressed breathing, does not appear to exert any permanent benefit.

Prevention.—From what has been stated regarding the nature of cattle-plague (rinderpest), it must be evident that its prevention can be effected only by the destruction of the specific virus, or by removing beyond its influence all animals on which it might fasten. Sheep, fresh hides, hay, or any other fodder and litter from countries where this ruinous plague exists, or has recently visited, should not be allowed to enter the ports of any other country. All foreign stock should be inspected at the ports of debarkation, and inspectors should have imperative orders for the immediate slaughter and disinfection of cattle-plague subjects, and of any animals with which they have been in contact. But even with such precautions it has been found in England that imported cattle frequently bring with them catching disorders, notably foot-and-mouth disease. Since foreign cattle constitute, however, less than five per cent. of the total cattle stock of the country, such risks should be removed by converting the foreign cattle traffic into a dead-meat trade.

Rinderpest being found to resemble small-pox in men and sheep, it was thought that its propagation and virulence might be abated by vaccination with cowpox lymph; but cattle, even when effectually vaccinated, which is often a difficult task, readily take rinderpest, often in its most mortal forms. Inoculation with the discharges from mild cases and from young calves has been tried as a palliative; but the disease thus artificially developed, loses nothing either of its severity or of its dangerous contagious character. Cattle in Oxfordshire receiving for several weeks daily doses of sulphite of soda are stated to have had the plague in a mild form.

Where an outbreak occurs, the diseased animals must be promptly destroyed, and all cattle in immediate contact with them should likewise be slaughtered. This 'stamping-out system' prevents the multiplication and diffusion of the virus, and hence saves still further losses. It is rigidly and successfully carried out in many European continental countries. By stamping out and strict isolation, eight or ten outbreaks in Aberdeenshire were suppressed without serious loss. A French outbreak on the Belgian frontier, 1865, Sep., was stamped out with the sacrifice of 43 animals. The disease was imported to Paris in Nov. by two gazelles purchased in London by the French Acclimatization Soc. Before it was stayed by slaughter and segregation, 34 animals, including yaks, antelopes, deer, gazelles, goats, and peccari, died or were destroyed. The determined slaughter of diseased and infected animals, and the restrictions on the movement of all stock, were the only means that reduced the number of attacks during the British outbreak of 1865,6. As is officially recorded in the Commissioner's Report, No. IV., p. 6, 'where the percentage of killed is high the ratio of increase of the disease

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is low, and *vice versâ*. This has generally been noticed under each county and district.'

When rinderpest is in the neighborhood, it is desirable daily to sprinkle the walls, wood-work, and floor of the sheds and hovelling with carbolic acid solution, and to keep up throughout the premises a continual odor of this useful antiseptic, and with a diluted solution of the acid, or with M'Dougall's disinfecting soap, to wash over the cattle daily. The animals should be carefully fed on digestible soft food; receive daily about an ounce of sulphite of soda in a mash; and, in order to note the first access of the disease, should have their temperature examined by the thermometer every night and morning.

The recommendations of the British cattle-plague commissioners for the purifying of infected sheds, litter, and manure must receive careful attention. In whatever premises infected beasts have stood, the walls should be lime-washed, a pint of carbolic acid being added to each pailful of the whitewash. The floors and wood-work, after being washed and scrubbed with boiling water, should be sprinkled with a strong solution of carbolic acid. The sheds being emptied of their living inhabitants, and the doors and windows closed, sulphur should be burned, and the vapors allowed to float about for a couple of hours before the sheds are again thrown open to the purifying influences of abundance of fresh air. A pound of sulphur placed on a shovel of burning coals suffices for a twelve-stalled shed or byre. Where C. P. has raged this cleansing and fumigation should be repeated, and, if possible, several weeks allowed to elapse before the premises are again occupied by sound animals. All shovels, forks, buckets, or brooms that have either directly or indirectly come in contact with diseased or infected animals, should be washed with the carbolic acid solution. The clothes and boots of attendants, inspectors, and others coming in contact with plague-stricken animals must be similarly cleansed. The manure should be sprinkled with carbolic acid at intervals of a few days, and then covered over with a foot of earth, freely mixed with soil, or carted away and plowed in. It is safer thus to put the manure on the arable land than to use it as a top-dressing for the pastures.

Authorities.—Official Reports of Brit. Commissioners, Nos. I., II., III., and IV.; *The Cattle Plague*, by Prof. Gamgee; *Die Rinderpest*, by Roloff (2d ed., 1877); and numerous monographs by German authorities.

See MURRAIN: PLEURO-PNEUMONIA: EPIZOOTIC: SPLENIC APOPLEXY.

CATTLE PLAGUES IN THE UNITED STATES:—

CONTAGIOUS LUNG-PLAGUE OF CATTLE, or CONTAGIOUS PLEURO-PNEUMONIA, or PULMONARY MURRAIN.—This has prevailed in Europe for hundreds of years. In this country it is always due to importation, and has spread only by contagion. Introduced in 1843 by one cow sold by the captain of an English vessel to a milkman in Brooklyn, N. Y., it spread to various places near the Atlantic coast, and has never been eradicated. In 1859. it was brought to Mass. by

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four cows imported from Holland and soon spread to several towns. By authority from the legislature sick and suspected animals were killed, and in six years the disease was 'stamped out' at a cost to the state of more than \$77,000, and a loss to the farmers of about \$250,000. Until 1883, this disease was confined to a small area, but was then scattered in several western states. *Cause*.—This disease is caused doubtless by bacteria which are taken into the lungs, produce inflammation, and destroy or radically change the tissues of these organs. It spreads more rapidly in a hot and moist climate than in one which is cold and dry, and is aggravated by impure air, improper food, and exposure. Period of incubation varies from ten days to several months. *Symptoms*.—A slight, dry and peculiar cough, increased temperature, diminished appetite, watery discharges from the eyes and nose, irregular action of the bowels, rapid and laborious breathing, great depression of the vital forces. The disease may terminate fatally in a few days or may be prolonged for months. *Prevention*.—Inoculation has often been tried with unsatisfactory results. Suspected animals should be immediately isolated and disinfectants freely used. Manure from sick animals should be mixed with quicklime and plowed into the land, and litter or fodder left in the stables should be burned. Animals which have been exposed to contagion may be made to breathe the fumes of burning sulphur in a close building every day for some weeks, and two drams of powdered copperas given daily to each mature animal. *Treatment*.—In clearly marked cases it is best to kill the animals at once. No one but a skilful veterinarian should attempt to treat this disease. Laxatives, diuretics, and sedatives are sometimes helpful in the early stages, and stimulants and tonics when prostration ensues. The inhalation of antiseptic remedies may also be useful. See PLEURO-PNEUMONIA, EPIZOOTIC.

APHTHOUS FEVER, VESICULAR MURRAIN, or FOOT-AND-MOUTH DISEASE.—A remarkably contagious malady of domestic quadrupeds, especially those with cloven feet. It is marked by blisters on the mouth and feet and on the udders and teats of females. It is communicated by contact with diseased animals or articles which they have infected; also by the use of milk of such animals. This disease was introduced into this country from Canada in 1871, and prevailed in n. New York and New England; but the affected cattle were isolated, and the disease disappeared. It was brought also to Baltimore by an importation of Channel Island cows in 1883, but was soon eradicated. As the poison does not pass through the air, but is communicated by solid bodies, this is more readily controlled than other animal plagues. *Symptoms*.—Chilliness followed by increased temperature, heat and redness of the mouth, soreness of the udder, lameness, and inclination to lie down. On the second or third day large blisters appear in the mouth and between the hoofs. These soon break leaving raw sores. Inflammation is sometimes so severe as to cause the hoofs to fall off and the bones of the feet to decay. If properly cared for the majority of cases will recover in from eight to

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fifteen days, though fatal cases often occur. *Prevention.*—The isolation of all infected animals, with thorough disinfection of the stables and everything with which they have been in contact. *Treatment.*—Perfect cleanliness, laxatives, cooling and astringent lotions for the mouth, poultices or caustics for the feet, and cool, soft food.

MALIGNANT ANTHRAX, BLOODY MURRAIN, CARBUNCULAR FEVER, or CHARBON.—This is caused probably by unhealthy local conditions. In hot, damp seasons it spreads rapidly and is extremely fatal. It manifests itself in different forms but is always characterized by sudden and extreme changes in the blood and a strong tendency to gangrene; it is extremely contagious, and is especially likely to attack young and thriving animals. This disease has been known from early times and prevailed in many lands. It was epidemic in n. New York 1825, near Philadelphia 1834–36, and in Louisiana 1837–39. It often prevails in malarious districts of the south. The virus is exceedingly active, retains its vitality for a long period, and withstands a temperature of 145 degrees. *Causes.*—A plethoric condition of the system, sudden changes from poor to rich food, insufficient exercise, exposure to extremes of temperature, and a malarious atmosphere. *Symptoms.*—In many cases the disease assumes an apoplectic form and the animal dies almost instantly. Others are marked by nervous prostration, accelerated pulse, rapid breathing, blood stains on the mucous membranes, and bloody matters in the urine and dung. In the early stages the temperature is elevated, later it decreases. The spleen is greatly enlarged and often ruptured. *Prevention.*—Good food, pure water, exercise, protection against extremes of temperature, keeping from undrained lands and rich river bottoms in hot, dry times, and attention to hygienic conditions. Isolation of the sick and thorough disinfection must not be neglected. *Treatment.*—The diseased tissues of local swellings may be destroyed by caustics, and antiseptic lotions may be used. Tonics and stimulants are required to keep up the strength, laxatives and diuretics to eliminate the poison, and antiseptics to prevent its propagation.

TEXAS FEVER, SPANISH FEVER, or SPLENIC FEVER.—This originates in malarious portions of the south, and is communicated to cattle of other regions. Mild in its original home, it often is malignant elsewhere. It is characterized by decomposition of the blood. The spleen, liver and kidneys are greatly enlarged and softened. The disease has been carried to the western and middle states, and cases have been known in New England. It is spread by discharges from the bowels of affected animals. The virus is usually, but not always, destroyed by frost. *Symptoms.*—Skin dry and hot, eyes dull and inflamed, weakness, appetite poor, bowels constipated followed by diarrhea, urine scanty and high colored, and elevated temperature. Affected cattle are usually covered with ticks. *Prevention.*—Rigid quarantine. Except in cold weather no cattle from regions in which this disease originates should be allowed elsewhere. Isolation of diseased and suspected animals. *Treatment.*—

CATTLEYA—CAUB.

Seldom satisfactory. Large doses of muriatic acid followed by quinine are sometimes beneficial. Soft mashs should be given for food. Inoculation has been tried with varying results.

CATTLEYA, n. *căt'lě-ya* [named by Lindley after Wm. Cattley, Esq.]: in *bot.*, extensive genus of orchids, natives of Central America and Brazil, where they are found on the bark of trees and on rocks. The species bear two or more flowers, generally rose-colored, occasionally yellow.

CATTOLICA, *kât-tol'ě-kâ*: town of Sicily, province of Girgenti, 14 m. n.w. of the city of Girgenti. It has extensive sulphur-works. Pop. 7,200.

CATTY, n. *kăt'tĩ* [Malayan *kati*; Jap. *kin*]: Chinese weight of about $1\frac{1}{4}$ lb. It is the unit of weight used in China, and by the Malays.

CATTYWAR: see KATTYWAR.

CATULLUS, *ka-tŭl'lus*, VALE'RIOUS: celebrated Roman lyricist: b. Verona, B.C. 87; date of death unknown. His father was an intimate friend of Julius Cæsar, and the young poet must have frequently met the great warrior at the paternal residence, when the latter was on his way to Gaul. In early life he went to Rome, where his career was that of an epicurean, and the expense of this kind of living soon involved him in debts; and he followed the pretor Memmius to Bithynia, with the intention, like his superior, of wringing a fortune out of the provincials. This fashionable but felonious method of acquiring money did not succeed in C.'s case, mainly, however, through the more dexterous cupidity of Memmius. After his return C. appears to have lived mostly in Rome, in very straitened circumstances. His poems, 116 in number, chiefly lyrics and epigrams—brought to light first by Benvenuto Campesani, of Verona, in the beginning of the 14th c.—have always been justly admired for their exquisite grace and beauty of style, but are in many passages grossly indecent. In higher styles of writing C. was equally successful, especially in his odes, of which unfortunately only four have been preserved. His heroic or narrative poem on the marriage of Peleus and Thetis—consisting of more than 400 hexameter lines—and the wild enthusiastic poem entitled *Atys*, are especially worthy of notice. Most of the earlier editions of C. include the works of Tibullus and Propertius. The best modern editions are by Sillig (1823), Lachmann (1829), and Ellis (1867 and '78). There are English translations by Lamb (1821), Martin (1861), Cranstoun (1867), etc. See Munro's *Criticisms* (1878).

CAUB, *kowb*: town of Nassau, n. Germany, on the right bank of the Rhine, 21 m. w.n.w. of Wiesbaden. It is noteworthy as the place where Blücher crossed the Rhine with his army, 1814, Jan. 1; also as the place where, till 1866 toll was levied by the Duke of Nassau—the only ruler who kept up this feudal privilege—from vessels navigating the Rhine. C. has underground slate-quarries; and opposite, on an island in the river, where Louis le Débonnaire died,

CAUCA—CAUCASIAN.

840, is a castle called the Pfalz, built 1326, said to have been resorted to for safety by the Countesses Palatine during their confinement. C. is threatened with destruction by the disintegration of the mountains behind, and in 1876, Mar., a destructive landslip took place. Pop. 2,200.

CAUCA, *kow'ká*: river of Colombia, S. America, which after flowing 500 m. joins the Magdalena. It gives name to a department of 260,000 sq. m., and (1881) 621,000 inhabitants.

CAUCA: state in the United States of Colombia, S. America, having for e. boundary the w. coast of the Caribbean Sea; area, 257,000 sq. m., being more than of all the other states combined. Its cap. is Popayan. Besides vast herds of cattle and mules C. produces the cereals; also coffee, cocoa, cotton, sugar, and tobacco. Pop. (1892) est. 700 000.

CAUCALIS, n. *kaw'kal-ís* [Gr. *kaukalis*, an umbelliferous herb]: in *bot.*, genus of umbelliferous plants, consisting of herbs with multifid leaves. All the species are natives of Europe and the temperate parts of Asia and Africa. None of the species are attractive in appearance.

CAUCASIAN, a. *kaw-ká'zhĭ-ăn*: pertaining to Mount Caucasus: N. one belonging to the Indo-European race, supposed by some to have originated near Mount Caucasus; Aryan.

CAUCASUS.

CAUCASUS, *kaw'ka-sūs*, and the CAUCASIANS, *kaw-kā'shī-anz*, or *-zhī-anz*: region and people near the boundary line of Europe and Asia, between the Black and Caspian seas. The great mountain range of the Caucasus forms the backbone of a well-marked geographical region, nearly corresponding with the Russian governor-generalship or lieutenantancy of Caucasia. The natural and administrative n. limit is the great Manitch depression, extending from the Sea of Azof to the Caspian, and including the basins of the Kuban and Terek rivers. The s. natural limit is along the basins of the Rion and Kur rivers. The Russian province comprises all the Russian territory to the Turkish and Persian frontiers, including also part of the Armenian highlands and the mountain masses adjoining them, now known by the infelicitous name of Little Caucasus, s. of the Rion and Kur rivers. Little or Anti-Caucasus is connected with Caucasus proper by the narrow Mesk ridge, crossing the Rion-Kur valley between the headwaters of those streams. The Sea of Azof and the Caspian seem to have been anciently connected by the Manitch depression; s. of which extend vast steppes of flat, treeless land—fertile, but with little or no water. South of the steppe to the n. spurs of the mountains is luxuriant park land, covered with magnificent grasses, and also quite level. Beyond this rise the mountains in successive terraces. On the s. side, toward the Rion and Kur, the mountain face is much steeper and more sudden.

The Caucasus occupies the isthmus between the Black Sea and the Caspian, its general direction being from w.n.w. to e.s.e. From the peninsula of Taman on the Black Sea, to the peninsula of Apslheron on the Caspian, it has a length of about 750 m. The breadth, including the secondary ranges and spurs, is about 150 m., but that of the higher Caucasus does not exceed 70 m. This range, formerly regarded as belonging entirely to Asia, is now usually treated as part of the boundary-line between Europe and Asia, though the political demarcations do not coincide. The higher and central part of the range is formed of parallel chains, not separated by deep and wide valleys, but remarkably connected by elevated plateaus traversed by narrow fissures of extreme depth. The highest peaks are in the most central ridge or chain, at least six of them over 16,000 ft., much exceeding the highest Alps. Mount Elburz rises 18,000 ft. above the sea; Kazbek more than 16,500 ft.; and between these are Kosh-tan-tau and Dikh-tau. Here the line of perpetual snow is between 10,000 and 11,000 ft. high; but the whole amount of perpetual snow is not great, nor are the glaciers very large or numerous. For more than 100 miles' length of the main ridge, there are no passes lower than 10,000 ft. The central chain, in its highest part at least, is granitic or even pure granite. On either side of the granitic axis are metamorphic rocks, such as mica-schists and talc-schists; and beyond these, clay-slates and schists. The secondary parallel chains on both sides of the central ridge are of limestone. The spurs and outlying mountains or hills are of less extent and importance than those of almost

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any other mountain-range of similar magnitude, subsiding as they do until they are only about 200 ft. high along the shores of the Black Sea. Some parts are entirely destitute of wood, but other parts are very densely wooded, and the secondary ranges, near the Black Sea, bear magnificent forests of oak, beech, ash, maple, and walnut; grain is cultivated in some parts to a height of 8,000 ft., while in the lower valleys, rice, tobacco, cotton, indigo, etc., are produced. As might be expected from the geographical situation of the C., the climate, though generally healthful is very different on the n. and s. sides, the vine growing wild in great abundance on the south, not on the north. The s. declivity of the mountains, toward Georgia, presents much exceedingly beautiful and romantic scenery.

There are no active volcanoes in Mount C., but every evidence of volcanic action. Elburz and Kazbek both are of volcanic origin. There are hot springs and mud volcanoes at each end of the range, and there are also famous naphtha springs in the peninsula of Apsheron (see BAKU). Mineral springs also occur in many places. The bison, or aurochs, is found in the mountains; bears, wolves, and jackals are among the carnivorous animals. Lead, iron, sulphur, coal, and copper are found.

The waters of the C. flow into four principal rivers—the Kuban, and the Rion or Faz (anc. *Phasis*), which flow into the Black Sea; and the Terek and the Kur, which flow into the Caspian. Kuban and Terek are n., Rion and Kur, or Kura, s. of the mountains. The Russians have, with great labor, carried a military road through a valley somewhat wider than most of the Caucasian valleys. This is the tremendous fissure or ravine of the Dariel gorge, about half-way from Black Sea to Caspian. The road passes over a height of abt. 8,000 ft., and is protected by many forts. The only other road is by the Pass of Durbend, near the Caspian Sea. There is a railway from Baku by Tiflis to Poti and Batum.

CAUCASIAN was the name adopted by Blumenbach (q.v.), for one of his main ethnological divisions of mankind; and as the solitary Georgian skull that he had was the finest in his collection, the Caucasian was taken by him as the finest type of the Indo-European stock. Dr. Latham's remark on Blumenbach's narrow basis, is: 'Never has a single head done more harm to science than was done in the way of posthumous mischief by the head of this well-shaped female from Georgia.' Subsequent ethnologists have, mainly on philological grounds, broken up the Caucasian variety of Blumenbach into two well-marked philological groups, the Aryan (q.v.), or Indo-European, and the Shemitic (q.v.). Syro-Arabian peoples. The name Caucasian was clearly a misnomer when it suggested affinity in blood or in language between the very various races of the Caucasus, classified below, and Aryans or Semites; and Prichard and others proposed actually to connect most of the Caucasus peoples with the Mongolian races of Asia. Later anthropologists, finding the word convenient, use Caucasian or Caspian for the fair type of man as opposed to the Mongolic or yellow type,

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but they distinctly repudiate any suggestion of community of race or of language between the peoples so named; and desire to indicate a physical fact and an anthropological type. See ETHNOLOGY: also PHILOLOGY.

The Caucasus has been called the Mountain of Languages, from the multiplicity of tongues spoken in this narrow area—tongues many of them totally distinct from one another, and with one exception, apparently unconnected with the languages of any other part of the globe, or race of men; unless Sayce be right in his belief that the ancient Hittites (q. v.), whose empire in Asia Minor rivalled that of the Assyrians, were of the same stock. There are certain well-marked groups among them, within which manifest affinity prevails. (1) The southern division or Kartveli stock comprises the Georgians or Grusians, mainly in the upper and middle basin of the Kur; the Imeritians, w. of the watershed between the Kur and Rion; the Mingrelians farther w. reaching to the Black Sea; the Gurians, s. of the Rion; the Laz on the Turkish frontiers; and the Svans or Suanetians, between the Mingrelians and the higher Caucasus. (2) The western division contains the Tcherkess or Circassian race, formerly on the left bank of the Kuban, n. of Caucasus; the Abkhasians in the narrow strip of land between the Caucasus and the Black Sea on the s.; and the Kabards, n. and e. of Elburz. (3) The eastern division contains the Chechenz or Tchetchens on the n. slopes of the eastern Caucasus, down to the Terek; and the Lesghians further e. and s. It is doubtful whether the numerous small tribes called Lesghians have any affinity with the Tchetchens, or how far they are related to one another; only one, the Avars, have a written language, and they use Arabic characters. (4) The Ossetes or Ossetians in the centre of Caucasus, on both slopes about Kazbek, are unquestionably a race of the Aryan stock, and the language has affinity with the Persian branch; they call themselves Irun (probably meaning *Aryan*). All the Caucasian languages are extremely harsh. Some of them are regarded as inflectional, others as agglutinative.

In various portions of this territory, there are, of course, other intrusive elements of population of foreign race: Russian Slavs; Tartars; numerous Armenians; Kurds; Greeks; Tats and other Iranians or Tajiks; and a German colony from Würtemberg, east of Tiflis. Not merely do the inhabitants of the Caucasus differ widely in race, but they represent great variety of stages of culture, from the indolent, music-loving Georgians to the wild and semi-barbarous Suanetians. Christianity is the faith of some races, as the Georgians and Ossetes; Mohammedanism of a fanatical type that of others, as the Lesghians, while primitive pagan superstitions seem largely to underlie both religious professions. One Kartvelian tribe, the Khevsurs, has in some measure combined Christianity with Moslem usages.

The resistance which the Caucasian peoples for more than half a century offered to the arms of Russia, attracted to them the attention of the world. But with the capture in 1859 of Shamyl (q. v.) the prophet-chief of the Lesghians, who for more than 20 years had withstood the armies sent against

CAUCUS—CAUDINE FORKS.

him, the power of the Caucasians was shattered; by 1870 it was completely broken. The bulk of the Circassians migrated to Turkish territories in Asia or Europe; most of the Abkhasians have done the like. Of the original native Caucasian races, probably not much more than 1,000,000 remain. The ancient divisions of the country, Georgia, Imeritia, Svanetia, Ningreilia, etc., were based on tribal distinctions. These have disappeared from the Russian administrative system. According to the latter, the main range of Caucasus divides the province into Ciscaucasia n. of the mountains, and Transcaucasia s. of them; the former comprising the govts. of Stavropol, Kuban, Terek; the latter, those of Daghestan (really n. of Caucasus), Sakatal, Tiflis, Kutais, Sukhum, Black Sea, Elisabetpol, Baku, and Erivan. Add Batum and Kars (Russian Armenia), and the Trans-Caspian territory; and then Caucasasia in the widest sense has an area of 308,000 sq. m.; pop. 6,290,000.

The chief town in Ciscaucasia is Vladikavkaz, in Transcaucasia, Tiflis—the two connected by the great military road through the Caucasus. The old cap. of Georgia was Mtskheta, a good specimen of a Georgian word. For Caucasus and Caucasasia, see the map of RUSSIA: also CIRCASIANS: GEORGIA: IMERITIA: TRANSCAUCASIA: and, for the wars with Russia, SHAMYL.

CAUCUS, n. *kaw'kūs* [a supposed corruption of *Calkers*, who, with others, used to meet in Boston for political purposes previous to the independence of the United States.]: in the *United States*, a meeting preliminary to a public meeting of citizens for election or for other purposes, generally political; a factious meeting designed to influence the general body of the citizens: V. to hold a preliminary party meeting of the heads of the party with the view of devising new measures or plans of action. CAUCUSING, imp. CAUCUSED, pp. *kaw'küst*.

CAUDAL, a. *kaw'dāl* [L. *cauda*, a tail]: pertaining to the tail of an animal; in *bot.*, applied to thread at the bottom of the seed of a plant. CAU'DATE, a. *-dāt*, and CAU'DATED, a. in *bot.*, applied to seeds that have a tail-like appendage. CAU'DICLE, n. *-dī-kl*, in *bot.*, the tail-like process supporting the masses of pollen in orchids.

CAUDEBEC-LÈS-ELBEUF, *kōd-bēk'lēz-ēl-bōf'*: town of France, dept. of Seine Inferieure, 12 m. s. of Rouen; has manufactures of cloth. Pop. (1886) 11,038.

In the same dept., on the Seine, is a village named CAUDEBEC, a picturesque little town, formerly cap. of the Pays de Caux and strongly fortified. Pop. (1886) 2,200.

CAUDETE, *kow-dā'tā*: town of Murcia, Spain, 50 m. e.s.e. of Albacete. Pop. 6,500.

C. is the name also of a small place in New Castile.

CAUDEX, n. *kaw'dēks* [L. *caudex*, the trunk]: in *bot.*, the unbranched trunk or axis of a tree, as palms, tree-ferns, etc.

CAUDINE FORKS, *kaw'dēn* (*Furculæ Caudinæ*): two high, narrow, wooded mountain-gorges near the town of Caudium, in ancient Samnium, on the borders of Cam-

CAUDLE—CAULAINCOURT.

pania; noted for the defeat of the Romans in the second Samnite war (B.C. 321): see ROME.

CAUDLE, *kaw'dl* [OF. *chaudeau* or *chudel*, a kind of gruel or broth—from *chaud*, warm—from mid. L. *caldus*—from L. *calidus*, hot, warm: comp. Gael. *cadail*, sleep]: a warm drink containing wine or other liquors given to women at childbirth: V. to prepare caudle; to treat tenderly. CAU'DLING, imp. CAUDLED, pp. *kaw'dld*. CAUDLE-CUP, the drink given to women at childbirth; the glass of wine, or other liquor, drunk in honor of the child born.

CAUF, n. *kawf* [Celt. *kaff*; L. *cavus*, hollow: L. *cophinus*, a basket]: a chest for holding live fish; the box or cage for raising coal from the mine.

CAUGHNAWAGA, *kaw-nâ-wâ'ga*: village of about 500 Iroquois Indians, in Laprairie co., province of Quebec, Canada; on the s. bank of the St. Lawrence, at the foot of the Lachine rapids, 9 m. s.w. of Montreal. It is the intended terminus of the C. ship canal, and on the Montreal Lachine and Province Line railroad.

CAUGHT, v. pt. or pp. *kawt*: see under CATCH.

CAUL, n. *kawł* [AS. *carol*, a basket: F. *câle*, a kind of little cap: comp. Gael. *ceil*, to cover, to hide]: the omentum or fatty membrane covering the lower intestines; the thin membrane sometimes covering the head and face of a child when born; a net for inclosing the hair; a skull-cap; also spelt KELL.—The membrane encompassing a child's head at birth has had extraordinary superstitions connected with it from very early ages till the present day. It was the popular belief that children so born would be very fortunate, and that the C. brought fortune to those purchasing it. This superstition was so common in the primitive church, that St. Chrysostom felt it his duty to inveigh against it in many of his homilies. In later times, midwives sold the C. to advocates at enormous prices, 'as an especial means of making them eloquent,' and to seamen as an infallible preservative against drowning. It was supposed also that the health of the person born with it could be told by the C., which, if firm and crisp, betokened health, but if relaxed and flaccid, sickness or death. During last century it was common to find advertisements in English newspapers of cauls to be sold—from £10 to £30 being the prices asked. So recently as 1848, May 8, there was an advertisement in the *Times* of a C. to be sold at the price of six guineas, which 'was afloat with its late owner 30 years in all the perils of a seaman's life, and the owner died at last at the place of his birth.'

CAULAINCOURT, *kō lăng-kôr'*, ARMAND AUGUSTIN LOUIS DE, Duke of Vicenza: 1772, Dec. 9—1827, Feb. 19; b. Caulaincourt, dept. of Somme: statesman of the French empire. He early distinguished himself as an officer, was made a gen. of division 1805, and shortly afterward created Duke of Vicenza. In 1807, he was appointed ambassador at St. Petersburg. In 1813, he was made minister for foreign affairs. At Napoleon's abdication it was chiefly through C.'s intervention that more favorable conditions

were obtained for the fallen emperor, and that the island of Elba was ceded to him. During the Hundred Days, C. resumed office as minister of foreign affairs and was made a peer. He died in Paris.

CAULDRON, n. *kaw'l'drŏn*: see CALDRON.

CAULESCENT, a. *kaw-lĕs'ĕnt* [from a supposed mid. L. *caules'cens* or *caulescen'tem*—from L. *caulis*, a stalk]: in *bot.*, having a visible stem. CAU'LICLE, n. *-lĭ-kĭl*, a short stem. CAU'LICULE, n. *-lĭ-kŭl*, in *bot.*, a short stem; in *arch.*, one of the curled tops in a Corinthian capital. CAU'LICULES, n. plu. *-kŭlz*, in *bot.*, small stems rising immediately from the neck of the root. CAU'LIFORM, a. *-lĭ-fawrm* [L. *forma*, shape]: same as CAULESCENT. CAU'LINE, a. *-lin*, also CAU'LINARY, a. *-ĕr-ĭ*, growing on a caulis or stem. CAULIS, n. *kaw'lis*, the stalk or stem of a plant; an aerial stem.

CAULIFLOWER, n. *kŏl'ĭ-flŏwr* [OF. *col*, a cabbage—from L. *caulis*, a cabbage, a stem, and *flower*: Sp. *coliflor*; F. *choufleur*, a cauliflower]: variety of the common kale or cabbage (q.v.). It was cultivated by the Greeks and Romans, but was little attended to in England till the end of the 17th c.; yet prior to the French Revolution, C. was an article of export from England to Holland, while English C. seed is still preferred on the continent. The C. is entirely the product of cultivation. The leaves are not in this, as in other varieties of the same species generally, the part used, nor are they so delicate and fit for use as those of most of the others, but the flower-buds and their stalks, or, properly speaking, the inflorescence of the plant deformed by cultivation, and forming a head or compact mass generally of a white color. There are many sub-varieties, but all of them are rather more tender than the ordinary form of the species. The C. requires a moist, rich, loamy soil with abundance of manure, and above all, very careful cultivation, directed to the object of having the heads not merely large but as compact as possible. Great care is bestowed on the selection of proper plants for seed. C. may be preserved for some time fit for use by pulling the plant up by the roots, and hanging it in a cold and dry place.—BROCCOLI (q.v.) may be regarded as another kind of cauliflower.

CAULK, n. *kawk* [mid. L. *calchārĕ*, to press together: com. Gael. *calc*, to ram, to beat in; *calcair*, a caulker (see CALK)]: in a *ship*, the operation of driving oakum into the seams between the planks. CAULK'ER, n. one who. CAULKING-IRON, an iron chisel for driving in the oakum.—Caulking renders the seams of a vessel water-tight. The quantity of filling driven in depends on the thickness of the planking; it varies from 1 to 13 double threads of oakum, with 1 or 2 single threads of spun-yarn. The caulker first *raims* or *reems* the seam—that is, drives a C. iron into it, to widen the seam as much as possible, and close any rents or fissures in the wood; he then drives in a little spun-yarn or white oakum with a mallet and a kind of chisel; and afterward a much larger quantity of black or coarse oakum. The fibres are driven in until they form a

CAULOPTERIS—CAUS.

densely hard mass, which not only keeps out water, but strengthens the planking. The seam is finally coated with hot pitch or resin.

CAULOPTERIS, *kaw-lŏp'tēr-is*: generic name for the stems of fossil tree-ferns found in the carboniferous and triassic measures. They are hollow, and covered with the markings similar to the leaf-scars on recent tree-ferns. Twelve species have been described.

CAUQUENES, *kow-kā'nēs*, **BATHS OF**: a group of remarkable mineral springs long celebrated for their medicinal properties, in Chili, 62 m. s.s.e. from Santiago. An earthquake, 1835, suddenly reduced their temperature from 118° to 92° Fahrenheit.

CAURSENES: sometimes called the Pope's Merchants; a class of Italian usurers who made their appearance in London in the early part of the 13th c. After practicing the grossest extortion, they were expelled from London by Roger, Bishop of London, 1235. They subsequently obtained the protection of the pope and became very numerous. Their extreme exactions led to their prosecution in the civil courts, but authorities were found who were willing to grant them permission to continue their practices on the payment of large sums of money. They were expelled from London finally abt. 1260.

CAUS, *kō*, or **CAULX**, *kō*, **SALOMON DE**: abt. 1576—abt. 1630; b. Dieppe, France: physicist. Fleeing from persecution as a Protestant he went to England abt. 1612, and lived at Heidelberg 1614–20 as architect to the elector palatine Frederick V. His last ten years were spent in Paris; the tale of his dying insane in the hospital of Bicêtre appears to lack foundation. Arago, who rescued his books from oblivion, considered him the inventor of the steam engine. His *Von gewaltsamen Bewegungen*, which appeared at Frankfort 1615, and at Paris 1624 as *Les Raisons des Forces Mouvantes*, suggested an apparatus for raising water by the expansion and condensation of steam: from this the Marquis of Worcester may possibly have borrowed the ideas outlined in his *Century of Inventions* (1633), and *Exact and True Definition*, etc. C. published, also, *La Perspective* (London, 1612); *Institution Harmonique* (Frankfort, 1615); *Hortus Palatinus* (Heidelberg, 1620); and *La Pratique et Démonstration des Horologes Solaires* (Paris, 1624).

CAUSE.

CAUSE, n. *kawz* [F. *cause*—from L. *causa*, a cause: It. *causa*: comp. Gael. *cúis*, a thing, a cause]: the primary or original thing; a thing which produces another thing; anything which produces an effect; the person or thing that brings about or does something; that to which intelligent efforts are directed as working for a cause; a reason; a motive or inducement that urges or impels; a suit at law; a party or side: V. to effect or produce; to occasion; to create. CAU'SING, imp. CAUSED, pp. *kawzd*. CAUSAL, a. *kawz'ál*, relating to or expressing cause. CAUSALITY, n. *kaw-zál'í-tí*, agency of a cause; quality of causing. CAUSALLY, ad. *kawz'ál-lí*. CAUSABLE, a. *kawz'á-bl*, that may be caused. CAUSATION, n. *kaw-zál'shún*, the act or power of causing or producing. CAU'SATIVE, a. *-tív*, that effects as a cause. CAUSER, n. *kaw'zér*, one who causes; an agent producing an effect. CAUSE'LESS, a. having no cause. CAUSE'LESSLY, ad. *-lí*, without reason or cause. CAUSE'LESSNESS, n. state of not having a reason or cause; unjust grounds or reasons. —SYN. of 'cause, n.': motive; inducement; reason; incitement; account; sake.

CAUSE: term which, with its kindred words, 'Causality,' and 'Causation,' though familiar and intelligible in ordinary speech, has given rise to some of the most subtle questions in philosophy and theology.

In common language we are accustomed to describe as the C. of an event the one event immediately preceding it, and but for which it would not have happened. A man slips his foot on a ladder, falls, and is killed; we give the slipping of the foot as the C. of the fatality. A legislative assembly decides a question of great moment by the casting vote of the president, who is then frequently spoken of as the C. of all the good or evil that depended on the decision. Now, a slight examination shows that this mode of speaking is defective, as not expressing the whole fact, or, in other words, presumes a great deal that is not stated. In the supposed death from a fall there are many conditions necessary to the result besides the slipping of the foot—the weight of the body, the height of the position, the hardness of the ground, the fragility of the human frame, all enter into the C. strictly represented; but for practical purposes we leave out of account all those elements that may not be considered as at the moment under control, and allude to the one that may be so. And when we speak of the decision of an assembly being the effect of the president's vote we mean that his share in the responsibility is peculiarly great, or that, in order to turn the vote in one way all that is necessary is to secure his individual opinion. If we do not enumerate all the conditions of the event, it is because some of them will, in most cases, be understood without being expressed, or because, for the purpose in view, they may without detriment be overlooked.

When, however, we aim at strict accuracy, as in the investigations of science, we must not be content with singling out the one turning event, but must enumerate everything necessary to the result. A *scientific* C. is the

full assemblage of *conditions* (by their classes, if not as individual conditions), failing any one of which the effect would not happen. In a full explanation of the phenomenon of the tides, we must enumerate all the circumstances connected with their production—the attraction of the sun and moon, the motions of the earth and the moon in their orbits, the globular form and rotation of the earth, the liquidity of the sea, the mode of distribution of the sea over the earth—every one of which facts is an essential in the full causation. The effect cannot be adequately accounted for without adverting to every one of those conditions, and it is therefore the sum-total of them that is rightly described as the C. of the tides. Taking this complete view of causation it is found that every event that happens is the sequel to some previous event, in whose absence it would not have been, but which being present it is sure to occur. Between the phenomena existing at any instant and the phenomena existing at the succeeding instant there is an invariable order of succession; to a certain collocation of facts certain other facts always follow, and, as we believe, will continue to succeed. The invariable antecedent is termed the C.; the invariable consequent the effect. What is termed the *Law of Universal Causation*, consists in this, ‘that every consequent is connected in the manner now described with some particular antecedent, or set of antecedents.’—Mill’s *Logic*, book iii., chap. 5.

The physical philosopher—the chemist or physiologist—trusts to the uniformity with which the same C. yields the same effect; and if he can find out the true succession in one instance, he is satisfied that the same succession will always hold. In the physical sciences, therefore, there is no dispute as to the law of causation itself; the controversies on that head occur only in *metaphysics*. It is made a serious problem by mental philosophers, and also by theologians, to determine how we come by the irresistible belief that we are said to possess, that every event has, and must have, a cause. There are many answers to this question: *eight* are enumerated by Sir William Hamilton (*Discussions on Philosophy*, p. 611, 2d edit.). It is only necessary, however, to advert to the two radically opposite points of view from which the subject is now surveyed.

The one view is, that we have an instinct or *intuition* of the mind by which we are compelled to recognize this law, so that to us it is a necessary truth, which we cannot escape from if we would. Our experience of the outer world, doubtless, shows us that things follow one another in an orderly and uniform manner, that the stone that sinks in water to-day does not float to-morrow, but no experience could give us the sense of commanding necessity that we have of the law of C. and effect. ‘Causation is not the mere invariable association of antecedent and consequent; we *feel* that it implies something more than this.’ The philosophers who maintain this side give forth two different affirmations: the *one*, that we actually possess an intuitive belief of necessary causation; and the *other*, that our possession of the belief is a sufficient proof that the law actual-

ly pervades the universe. Experience operates to confirm us in those instinctive tendencies, but no amount of experience would have been able to create them.

The latest modification of the theory that ascribes our belief in causation to an intuition of the mind, is the doctrine promulgated by Sir. W. Hamilton, to the effect that 'we are unable to think that the quantity of existence, of which the universe is the conceived sum, can be either amplified or diminished. We are able to conceive, indeed, the creation of a world; this, in fact, as easily as the creation of an atom. But what is our thought of creation? It is not a thought of the mere springing of nothing into something. On the contrary, creation is conceived, and is by us conceivable, only as the evolution of existence from possibility into actuality by the fiat or by the activity of the Deity. And what is true of our concept of creation, holds of our concept of annihilation. We can think no real annihilation—no absolute sinking of something into nothing.'—*Discussions*, p. 619. Thus, every effect must have a C., and every C. must have its effect, because, if it were not so there would be either a pure creation or a pure annihilation, neither of which, according to Sir W. Hamilton, is thinkable or conceivable by the human mind. That this doctrine has not found acceptance even by those who, if not actual disciples of the author, are most disposed to receive his philosophy generally, may be seen by referring to Prof. Fraser's *Essays in Philosophy*, p. 170; M'Cosh *On the Divine Government*, p. 529, 4th ed.; and Mansel, art. Metaphysics, *Encyc. Brit.*, 8th ed. So far from the creation or annihilation of matter or force being inconceivable, it may be said with truth that, until the end of last century, it was not known as a fact that the materials of the globe are absolutely indestructible. The effects of combustion and evaporation could hardly suggest anything else than the annihilation of a certain portion of material. Combustion merely transformed the material consumed into other shapes, nothing being absolutely lost. So much for ponderable matter. As regards force, or moving power, the demonstration that this is never absolutely lost, even on the many occasions when it is so to all appearance, is a still later result of laborious scientific inquiries, being, in fact, one of the conclusions reached within the last few years: see FORCE. To represent, therefore, one of the latest achievements of experimental science as a primitive intuition of the human mind is to violate our sense of propriety and consistency.

As opposed to the intuitional doctrine of causation there are a variety of views by Hume, Dr. Thomas Brown, and others, which need not be specified in detail. One may be given as an example. It has been seen that there are two affirmations in the theory just discussed; that the mind possesses an intuitive belief of causation, and that the possession of this belief is evidence of the existence of the law. Now, one or both of these affirmations may be denied; and the *denial* of either, by even a small minority of the human race, is held to be fatal to the theory, because *unanimity* is essential

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to the establishment of a universal instinct. Now, many men may possess an instinctive belief in the necessity of a cause to all effects, and of an effect to all causes; some, it is affirmed, do not; it cannot, therefore, be a universal or essential part of human nature.

In like manner, the second affirmation—namely, that the possession of an instinctive belief is a proof of the truth of the thing believed—is denied, on the ground that our instincts often dispose us to believe things that experience shows untrue. We have a strong natural tendency to believe in the universality and continuance of the exact order of things that we are ourselves born into, and are only put right by seeing the contrary. ‘A mere disposition to believe, even if supposed instinctive, is no guarantee for the truth of the thing believed. If, indeed, the belief ever amounted to an irresistible necessity, there would be then no *use* in appealing from it, because there would be no possibility of altering it. But even then the truth of the belief would not follow: it would only follow that mankind were under a permanent necessity of believing what might possibly not be true; just as they were under a temporary necessity—quite as irresistible while it lasted—of believing that the heavens moved, and the earth stood still. But, in fact, there is no such permanent necessity. Many of the propositions of which this is most confidently stated, great numbers of human beings have disbelieved. The things which it has been supposed that nobody could possibly help believing, are innumerable; but no two generations would make out the same catalogue of them.’—Mill’s *Logic*, book iii., chap. 21. Mr. Mill and others hold that the proof of the law of causation rests exclusively on the uniform and growing experience of the human race. This, however, is not inconsistent with our possessing the natural instinct above alluded to, by which we are led to suppose that what is will continue, and what has been will be repeated; an instinct that *coincides*, to a certain extent, with the law of C. and effect, and is therefore a predisposition on our part to accept what experience teaches on this head. It is only maintained that the instinct is of itself *no proof*, although useful so far as it prepares us for what there is real evidence for believing, and confirms and illuminates our belief. By yielding to the instinct in its crudest shape the inhabitant of the tropics scouts the idea that water can ever be solid; the African would deny the existence of white men, and even an intelligent European could not be persuaded that any metal would float. Experience must correct the instinctive tendencies, otherwise no reliance can ever be placed upon them; by which we acknowledge it as the sole test of truth, while intuitive dispositions are no test whatever.

Even those who maintain the instinctive necessity of the conviction that we are discussing, admit two great exceptions—viz., the existence of a FIRST C., itself uncaused, and the liberty of the will, or the exemption of human actions from the rule that applies so strictly to physical nature.

It is further contested between the two opposite schools of philosophy, whether or not MIND be the sole ultimate C.

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of all phenomena, as it is the C. most familiar to us—namely, the source of our voluntary exertions. On one side it is affirmed to be ‘inconceivable that dead force could continue unsupported for a moment beyond its creation. We cannot even conceive of change or phenomena without the energy of a mind.’ ‘The word action has no real significance, except when applied to the doings of an intelligent agent.’ ‘Phenomena may have the semblance of being produced by physical causes, but they are in reality produced by the immediate agency of a mind; if they do not proceed from the human or created, they are the result of the divine will.’ To this it is replied that we are here taking for granted that every kind of power is analogous to that which we happen to be first acquainted with; but it is a pure assumption without proof or relevance, to suppose that all modes of energy must conform to this one type.—Mill, book iii., chap 5. It is further pointed out that even in ourselves, pure mind, or mind acting by itself, is not known to be an efficient C.; it must be mind together with body. The laborer cannot sustain a day’s toil merely because of his *wish* to do so; he must be fed and rested, and have all his bodily organs in good condition, in order to do his work. The human system, when employed as a prime mover, can no more dispense with the material conditions than a steam-engine can work without coal, or when out of repair.—Bain *On the Emotions and the Will*, p. 472. Some of these replies, however, it is pointed out, though true, yet are aside from the question as to how the idea (*any* idea) of cause (*any* cause) arises in the mind; aside also from the question whether mind be or be not the *ultimate* cause. It is not shown to be unreasonable or improbable that a savage or a little child may get his first idea of *effect* through finding certain effects *caused* by himself—that all men may thus get an idea of cause—further, that finding themselves selecting certain courses of action with a view to cause certain effects, they do not thus become aware of cause and effect as involved in the system of nature, and aware of causation as having its ultimate source in a designing and selecting mind.

The subject of causation was very particularly studied by Aristotle. He enumerated four different kinds of causes, which have ever since had a place in philosophy. These are the *material*, the *formal*, the *efficient*, and the *final*. The first, or *material*, is what anything is made of; brass or marble is the material C. of a statue. The *formal* is the form, type, or pattern according to which anything is made; the drawings of the architect would be the formal C. of a house. The *efficient* is the power acting to produce the work, the manual energy and skill of the workmen, or the mechanical prime mover. The *final* C. is the end or motive on whose account the work is produced, the subsistence, profit, or pleasure of the workman. Aristotle mentions the case of a physician curing himself, as exemplifying all the causes in one and the same subject. It is obvious that these are what we should now term the aggregate of *conditions* necessary to the production of any work of man; it being

CAUSEUSE—CAUSTIC.

essential that there should be a motive for the work (final), a material to operate upon (material), a plan to proceed by (formal), and an exertion of energy to do what is wanted (efficient). When nature is viewed as the result of a creative mind these causes are considered as inhering in the divine contriver.

In popular language C. is held as identical with *explanation*. In other words, when a phenomenon which we are puzzled to account for is explained to our satisfaction we say that we know its cause, but we often seek for, and are satisfied with, explanations that have no value in the view of science; and on the other hand refuse to rest content with such as are scientifically valid. People occasionally insist on knowing the C. of gravity itself, something deeper than the discovery of Newton, and whatever explanation satisfies the mind would be accepted as the cause. Sometimes a theological explanation is offered, and at other times a metaphysical necessity is put forth.

CAUSEUSE, n. *kō-zāz'* [F. *causeuse*, talkative]: a drawing-room easy-chair for two sitting side by side yet face to face.

CAUSEWAY, n. *kawz'wā* [F. *chaussée*; OF. *chaulcée*, and *caucie*, a raised way—from mid. L. *calcēta*, or *calcēātā*, a made road—from L. *calcem*, lime: Sp. *calzada*, a pavement]: primarily a hardened raised roadway made with a mixture of lime so as to bear the tread of horses and general traffic; a raised roadway paved; a raised road over wet or marshy ground. CAUSEY, n. *kaw'zī*, the proper spelling for *causeway*. CAUSEY, v. to pave with blocks of stone. CAU'SEYED, a. *-zād*, or CAUSE'WAYED, a. *-wād*, paved with blocks of stone. TO KEEP THE CROWN OF THE CAUSEY, in *Scot. hist.*, to keep possession of the highest part of the principal paved street in defiance of all opponents; to throw down the gauntlet of defiance in a mutual feud; not to be driven to the wall. *Note.*—CAUSEWAY, is a corrupted spelling of the proper word CAUSEY. It may primarily have meant, a raised footpath: comp. Gael. and Ir. *casan*, the footway, a path.

CAUSTIC, a. *kaws'tik*, or CAUS'TICAL, a. *-tī-kāl* [Gr. *kaustikos*, having the power to burn—from *kaiō*, I burn]: burning; corroding; that has power to destroy a living texture; biting or burning; sharp and biting, as speech. CAUS'TIC, n. a substance that acts like fire when applied to a living body, as nitrate of silver. CAUSTIC'ITY, n. *-tīs'ī-tī*, the quality of being caustic. CAUSTIC CURVE, the curve whose envelope is formed by the rays reflected from a concave mirror.—SYN. of 'caustic, a.': pungent; cutting; stinging; searching; burning; corrosive; severe; satirical; sharp.

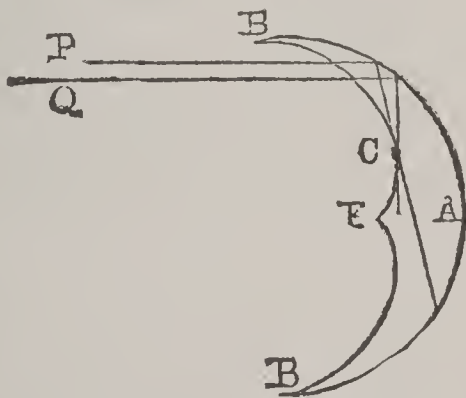
CAUSTIC, *kaws'tik*, in Medicine and in Chemistry; term applied to such substances as exert corroding or disintegrating action on the skin and flesh. *Lunar C.* is nitrate of silver, and *common C.* is potash. When used as a C. in medicine the substance is fused and cast into molds, which yield the C. in small sticks the thickness of an ordinary

CAUSTIC.

lead pencil, or rather less.—*Caustic* is also a term used in chemistry in an adjective sense—thus C. lime, or pure lime (CaO), as distinguished from mild lime, or the carbonate of lime (CaO, CO_2), C. magnesia (MgO), and mild magnesia (MgO, CO_2), etc.

CAUSTIC — CATA'CAUSTIC, *kăt-a-kaws'tik* — **DIA-CAUS'TIC**, *dī-a-*, in Optics: terms designating curves. Caustic is the name given to the curved line formed by the ultimate intersections of a system of rays reflected or refracted from a reflecting or refracting surface, when the reflection or refraction is inaccurate. When the caustic curve is formed by reflection, it is called the catacaustic—sometimes simply the caustic; when formed by refraction it is called the diacaustic curve. In mathematical language, a curve formed by the ultimate intersections of a system of lines drawn according to a given law is called the *envelope*, and is such that the lines are all tangents to it. As in a system of rays reflected or refracted by the same surface *all* follow the same law, it follows that the caustic is the envelope of reflected or refracted rays.

An example of the catacaustic is given in the annexed figure for the case of rays falling directly on a concave spherical mirror, BAB', from a point so distant as to be practically parallel. The curve may be said to be made up of an infinite number of points, such as C., where two very near rays, such as P, Q, intersect after reflection. This catacaustic is an epicycloid. The curve varies, of course, with the nature of the reflecting surface. In the case represented in the figure, the cusp point is at F, the principal focus. No such simple example can be given of the



diacaustic curve as that above given of the catacaustic. It is only in the simplest cases that the curve takes a recognizable form. In the case of refraction at a plane surface it is shown that the diacaustic curve is the evolute either of the hyperbola or ellipse, according as the refractive index of the medium is greater or less than unity.

A catacaustic may be seen on the surface of tea in a tea-cup about half full, by holding the circular rim to the sun's light. The space within the caustic curve is all brighter than that without, as it clearly should be, as *all* the light reflected affects that space, while no point without the curve is affected by more than the light reflected from half of the surface.

CAUTEL—CAUVERY.

CAUTEL, n. *kaw'těl* [mid. L. *cautēla*, prudence, caution]: in *OE.*, caution; condition; limitation; a cunning trick. **CAUTELOUS**, a. *kaw'těl-ūs*, artful; artfully cautious; wary. **CAU'TELOUSLY**, ad. *-lī*.

CAUTERY, n. *kaw'tér-ī* [Gr. *kautērīōn*, a hot iron for marking—from *kaiō*, I burn: L. *cautērīum*]: a burning or searing of living flesh with a hot iron, or by caustic medicine, so as to remove a diseased part. **CAU'TERIZE**, v. *-tér-īz*, to burn or scar living flesh. **CAU'TERIZING**, imp.: **ADJ.** burning; blistering: **N.** the act of burning or blistering. **CAU'TERIZED**, pp. *-īzd*. **CAU'TERIZA'TION**, n. *-ī-zā'shūn*, the act of burning or searing with a hot iron; also **CAU'TERISM**, n. *-īzm*, the application of caustics: see **BLEEDING: MOXA**.

CAUTION, n. *kaw'shūn* [F. *caution*—from L. *cautiōnem*, a taking heed: It. *cauzione*]: great care in the midst of dangers; forethought; a prudent course of conduct; security for; an advice; a warning: **V.** to warn; to exhort; admonish; advise. **CAU'TIONING**, imp. **CAU'TIONED**, pp. *-shūnd*. **CAU'TIONARY**, a. *-ēr-ī*, containing warning; given as a pledge. **CAU'TIONER**, n. in *Scot.*, one bound for another. **CAU'TIONRY**, n. *-rī*, in *Scot.*, suretyship; the obligation of suretyship. **CAU'TIOUS**, a. *-shūs*, very careful in conduct; wary; watchful; discreet. **CAU'TIOUSLY**, ad. *-lī*, in a cautious manner; warily. **CAU'TIOUSNESS**, n. the quality of being cautious; vigilance; watchfulness; prudent care.—**SYN.** of 'cautious': careful; wary; circumspect; prudent; discreet; watchful; vigilant; heedful; thoughtful; anxious; scrupulous; — of 'caution, n.': prudence; watchfulness; circumspection; warning; admonition; care; forethought; heed; vigilance; providence; counsel; advice; injunction; security; bail; guaranty.

CAU'TION, in the Law of Scotland, like Guaranty (q.v.) in England: obligation undertaken by a second party, whereby he binds himself, failing the primary obligant, to fulfil his obligation, whether it be of a pecuniary nature or otherwise. See **GUARANTEE ASSOCIATION**.

CAUTION, for a cash credit: see **CASH ACCOUNT**.

CAUTION, JUDICIAL, in the Law of Scotland: form of protection for a creditor or for a debtor; of two kinds—one by warrant for appearance, the other by bond of presentation.

CAUTION, JURATORY: see **POOR'S ROLL**.

CAUVERIPURAM, or **KAVERIPURAM**, *kaw-ver-ī-pū'ram*: town of the dist. of Coimbatore, presidency of Madras, on the right bank of the Cauvery; lat. 11° 54' n., and long. 77° 48' e. It takes its name from the neighboring gorge of 30 m. in length through the Eastern Ghauts, along which the Cauvery finds a passage. Pop. 7,000.

CAUVERY, or **KAVERI**, *kaw'ver-ī*: river in the s. of Hindustan, rising in Curg, and flowing through Mysore and Madras, with a course of 472 m., into the Bay of Bengal by various mouths. Its delta, with a coast of 80 m., and extending inland 70 m., lies almost wholly in the district of Tanjore. The C. is peculiarly available for irrigation; and

CAVA--CAVAILLON.

for improving it in this respect a grant of £50,000 was sanctioned 1841. During the rainy season the stream is navigable for small craft.

CAVA, n.: see AVA.

CAVA, LA, *lá ká'rá*: town of Italy, province of Salerno, 3½ m. n.w. of the town of Salerno. It is a flourishing place, with manufactures of silk, cotton, linen, and pottery. About a mile from C. is the celebrated Benedictine monastery of the Trinity, with its magnificent archives, containing 60,000 MSS. and 40,000 parchment rolls. Its library, formerly also rich in MSS. and rare printed books, has been dispersed. In the monastery church are the tombs of Queen Sibilla and of various anti-popes. Pop. of C. 6,000.

CAVAIGNAC, *ká-vîn-yák'*, LOUIS EUGÈNE: 1802-1857, Oct.; b. Paris; educated in the Polytechnic school, and the *Ecole d'Application* at Metz. He served first in the Morca, afterward in Africa (whither he was sent in 1832 into a kind of honorable exile, in consequence of a too free expression of opinion in favor of republican institutions), where he acquired great distinction by his energy and intrepidity. He was made chef de bataillon 1837, and rose to the rank of brigade-gen. 1844. In 1848, he was appointed gov. gen. of Algeria, but in view of the impending revolutionary dangers, was called to Paris, he having also been elected as a delegate to the national assembly by the two departments of Lot and Seine. In the insurrection of June which followed, C., as minister of war, had a most difficult task, and he evinced, during the four days and nights of the contest, remarkable presence of mind, firmness, and activity. His plan of action appeared strange and almost traitorous at the time. In opposition to the wishes of the national assembly, who desired that the troops should be dispersed over Paris, he divided his men into three separate bodies, which had to clear their several routes from obstacles in order to effect a reunion, streets and even quarters of the city being left for some time without military protection. Regarding the outbreak more as the beginning of a civil war than a mere insurrection he, in fact, met the insurgents in true order of battle. His operations were successful and his clemency was as remarkable as his generalship. When he had the power of assuming the dictatorship he resigned it into the hands of the national assembly, which appointed him president of the council. As a candidate for the presidency of the republic, when Louis Napoleon was elected, he received about a million and a half of votes. On the *coup d'état* of 1851, Dec., C. was arrested, but released after a short detention; and though he consistently refused to give in his adhesion to the empire he was permitted to reside in France without molestation. He died very suddenly of heart disease, at his country house near Tours, and was buried in the cemetery of Montmartre, Paris, in presence of many thousand spectators, including several republican leaders. In debates C. was remarkably unlike his countrymen, being not voluble and declamatory, but sober, clear, and moderate.

CAVAILLON, *ká-vá-yóng'*: town of Provence, France,

CAVALCADE—CAVALLER-MAGGIORE.

dept. of Vacluse, on the right bank of the Durance, 14 m. s.e. of Avignon. It is badly built and kept, but has an important railway junction, a fine town house, a church of the 12th c., and the remains of a triumphal arch, probably of Constantine's time. Many ruins and Roman relics are found on the site of ancient Cabello, a short distance s. C. was long included in the Comtat Venaissin. It suffered from an earthquake 1731. Till the revolution, when its fortifications were destroyed, it was a bishop's see, and had several convents. It is the centre of a fertile dist., called the garden of Provence; and has a trade in dried fruits and raw silk, and manufactures of madder and vernicelli. Pop. of town, 5,164; commune, 8,034.

CAVALCADE, n. *kāv'āl-kād* [F.—from It. *cavalcata*—from It. *cavallo*, a horse—from L. *caballus*, a horse (see CAVALRY)]: a procession of persons on horseback.

CAVALIER, *kāv-a-lēr'*, in Fortification: defense-work constructed on the *terre-plein* or level ground of a bastion. It rises to a height varying from 8 to 12 ft. above the rampart, and has a parapet about 6 ft. high. Its uses are to command any rising ground held by the enemy, within cannon-shot; and to guard the curtain, or plain wall between two bastions, from being enfiladed. For these purposes it mounts heavy ordnance. It may be either curved or bounded by straight sides.

CAVALIER, *kā-vā-lyā'*, JEAN: abt. 1680-1740, May: Camisard chief; b. Ribaute, in Languedoc. He was the son of a peasant, a keeper of sheep, and a baker's apprentice, but fled from persecution to Geneva 1701, and returned 1702 to share the Protestant revolt in the Cévennes, of which he soon shared the chief command with Roland. He developed marked military skill, defeated the royal troops on the Ardèche 1703, Feb. 10, endured a defeat there a few days later and another at Tour-de-Bellot, Apr. 30, and retrieved them by a surprising series of victories. He made terms with the govt. at Nismes 1704, received a pension, a commission, and authority to raise a regiment of Camisards for service in Spain, but was repudiated by his comrades, and called traitor and coward. Ill-received by the king, he left France, married in Holland a lady who had been sought by Voltaire, went to England, and was sent with his regiment to Spain to serve under Lord Peterborough and Sir C. Shovel, 1705, May. At Almanza his men recognized a French regiment as foes in the Cévennes, and rushed into a hand-to-hand fight, in which C. narrowly escaped death. Returning to England he was pensioned and at length made a maj.gen. and gov. of Jersey and then of the Isle of Wight. He died at Chelsea. Malesherbes, in a remarkable passage, summed up C.'s singular gifts of talent and character. *Memoirs of the War in the Cévennes, under Col. C.*, probably by Galli, is little valued. See CAMISARDS.

CAVALLER-MAGGIORE, *kā-vāl'lēr mād-jō'rā*: town of n. Italy, province of Cuneo, 24 m. n.e. of Coni. It was formerly fortified and defended by two castles, but of these even the ruins have almost disappeared. It is a busy place. Pop. 5,300.

CAVALRY.

CAVALRY, n. *kāv'āl-rī* [OF. *cavallerie*, horsemen—from It. *cavalleria*, knighthood, cavalry—from It. *cavallo*; Sp. *caballo*; F. *cheval*, a horse—from L. *caballus*; Gr. *kabal'les*; OE. *caple*, a horse: comp. Gael. *capall*, a war-horse—from *cath.* battle; *pall*, a horse]: the part of an army which fights on horseback; horse-soldiers. **CAV'ALIER**, n. *-à-lēr* [It. *cavaliere*: F. *chevalier*]: a horseman; an armed horseman; a knight; a gay soldier; in *mil.*, an elevation of earth situated within a work overlooking the surrounding parts: **ADJ.** sprightly; gay; brave; generous; haughty. **CAV'-ALIERS**, n. plu. *-lerz*, in *Eng. hist.*, the partisans of Charles I. in opposition to the roundheads (q.v.), or parliamentary party. **CAV'ALIER'LY**, ad. *-lī*, arrogantly; disdainfully. **CAV'ALIER'NESS**, n. a haughty and disdainful manner.

CAVALRY, *kāv'āl-rī*: general name for horse-soldiers or troopers. The subdivisions are very numerous; such as guards, dragoons, lancers, hussars, cuirassiers, mounted rifles, etc. The C. force of the British army is usually divided into *Household* and *Line*. The numbers voted for 1881-82 were:

	Household Cavalry.	Line Cavalry, Home Service.	Line Cavalry in India.
Officers	75	506	207
Non-commissioned officers	168	1,027	369
Rank and file	1,053	9,553	3,726
	1,296	11,083	4,302

The difference between the household C. and the line is that the former belongs to the *Guards*, a specially favored body of troops, while the latter comprise all who are *not* guards. The regiments are 31 altogether. The list comprises 2 regiments of life guards (red), 1 of horse guards (blue), 7 of dragoon guards, and 21 of dragoons. Of these last-named 21 regiments, the 1st, 2d, and 6th are simply called dragoons; the 5th, 9th, 12th, 16th, and 17th, lancers; the 3d, 4th, 7th, 8th, 10th, 11th, 13th, 14th, 15th, 18th, 19th, 20th, and 21st, hussars. A distinction is often made between *heavy* and *light* C.; and, in continental armies, this distinction is very marked; but in England the men and horses are not selected with much reference to this matter the heavy being often too light, and the light too heavy to correspond with their designations. So far as the distinction holds in the British army, the dragoon guards, horse guards, and life guards are classed and equipped as heavy C., the dragoons medium, and the lancers and hussars as light C., for scouring a country. It was in the capacity of light C. that the Prussian uhlans rendered such important service in the late war between Prussia and France, acting as wide stretching feelers to the main bodies to which they were attached.

The line C. regiments in the British service have generally eight troops of 55 rank and file each, with 88 commissioned and non-commissioned officers to the regiment. The officers for a full C. regiment comprise 1 col. (as general officer), 1 lieut.col., 1 major, 8 captains, 18 subalterns and other commissioned officers, and 59 non-commissioned officers. A ~~full col.~~, in the guards C. takes rank with a full col. in the

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line C.; and a maj. in the former with a lieut.col. in the latter—an arrangement not altogether felicitous.

Nine months of drilling is the least time requisite to make a recruit fit to mount on duty, during which period he is drilled for eight hours a day. For the Brit. C., Londoners and agricultural laborers are mostly sought for; provincial mechanics are not found so available. The purchase of C. horses is an important matter. The veterinary surgeon of the regiment is sent out to buy; but no horse is paid for till approved by the commanding officer. The usual maximum of price fixed is £33 for a horse three to five years old; but the horse costs the nation £50 or £60 by the time it is thoroughly fit for service. See DRAGOONS: GUARDS: LANCERS: etc.

The United States C. system is of the same type with the European: a company comprises 64 men; two or more companies form a squadron; ten companies form a regiment; the C. arms are sabres, carbines, and pistols.

CAVALRY TACTICS: duties, place, and movements of mounted troops, and proportion of such troops to other soldiers in an army. Authorities differ concerning the proportion that ought to be observed between cavalry and infantry in an army; in France and Austria, the ratio is about 1 to 5; in Prussia and Bavaria, 1 to 4; in Russia, 1 to 6; in England, 1 to 8. In the U. S. army the proportion has been variable; 1884, June 30, the cavalry comprised 10 regiments, with 430 officers and 7,115 enlisted men; the whole strength of the army being 26,383.

So far as concerns actual duties, heavy cavalry charge the enemy's cavalry and infantry, attack the guns, and cover a retreat, while the light cavalry make reconnaissances, carry dispatches and messages, maintain outposts, supply pickets, scour the country for forage, aid the commissariat, pursue the enemy, and strive to screen the movements of the infantry by their rapid maneuver on the front and flanks of their army. A cavalry horse will walk 4 m. in an hour on general service, trot 8 m. in maneuvering, and gallop 11 m. in making a charge. The cavalry usually attack in line against cavalry, *en échelon* against artillery, and in column against infantry. When an attack is about to be made the cavalry usually group into three bodies—the attacking, the supporting, and the reserve. The United States army regulations provide that the cavalry in battle should be in *échelon* at the centre and on the wings; should not gallop until charging; should never halt to receive a charge, but go to meet it, or else retire maneuvering; should reserve one third of its squadrons for pursuit or to meet a reverse—the reserve squadrons being not in a second line with intervals, but in *échelon* or in column either abreast of, or in the rear of, one of the wings.

Close combat and hand-to-hand struggle are the province of cavalry; infantry and artillery may fight at a distance, but cavalry cannot. It is rare that two bodies of cavalry stand to fight each other; the weaker of the two, or the less resolute, usually turns and gallops off. The work to be done by the horse is to pursue, to overwhelm, to cut down. They cannot wait to receive an attack like infantry. They

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must either pursue or retreat; and on this account it has been said, 'rest is incompatible with cavalry.' The infantry and artillery more frequently secure the victory; but the cavalry prepare the way for doing this—capture prisoners and trophies, pursue the flying enemy, rapidly succor a menaced point, and cover the retreat of infantry and artillery, if retreat be necessary. Cavalry is necessary to finish work mainly done by others; and, without its aid, signal success is seldom obtained on the field. Many of the brilliant achievements of the British in 1857 and the following year, in India, were rendered almost nugatory by the paucity of cavalry, while, as a contrast, the German victories of 1870 were enhanced by the splendid services of their uhlans and other light cavalry.

CAVAN, *kăv'an*: inland county in the s. of Ulster, Ireland; in the narrowest part of the island, 18 m. from the Atlantic, and 20 from the Irish Sea: area, 746 sq. m. About three-fourths is arable. Bogs and hills, with many small lakes, are in the n.w. The chief rivers are the Erne, the Woodford, and the Annalee. The e. half of C. rests on clay-slate and grauwacke; the mountain district in the w. is carboniferous formation. Of minerals, C. affords coal, iron, lead, and copper, with many mineral springs. The climate is cold and damp; and the soil is poor, wet, and clayey, except along the streams. In 1881, of 466,261 acres, 148,219 were in crop, the chief crops being oats, potatoes, turnips, and flax. The farms are small. Agriculture is the chief industry, but linen is manufactured to a considerable extent. Chief towns—Cavan, Bailieborough, and Belturbet. C. returns two members to parliament. The number of children attending school in the year ending 1880, March 31, was upward of 30,000. Pop. (1861) 153,906 (a reduction); (1871) 140,375; (1901) 97,541. Of the pop. (1901) 50,087 were males and 47,454 females.

CAVAN: capital of Cavan co., Ireland, on a branch of the Annalee, 70 m. n.w. of Dublin, with which it is connected by the Irish N.W. railway. The suburbs are chiefly wretched cabins. The principal buildings are in the west outskirts. A public garden was bequeathed by a late Lady Farnham, and the beautiful demesne of Lord Farnham lies between C. and Lough Oughter, which is about five m. w. Agriculture is the chief industry. Pop. (1891) 3,380.

CAVARZERE, *kăv-âr-ză'ră*: town of n. Italy, province of Venice, 22 m. s.s.w. of Venice city; on the Adige, which divides it into two parts called C. *destro* and C. *sinistro*. Its soil is fertile, and its inhabitants carry on active trade in cattle, silk, and wood for fuel. Pop. 5,000.

CAVASS, *ka-văs'*: in *Turkey*, a police-officer: see CAWASS.

CAVATINA, n. *kăv'ă-tě'nă* [It.]: in *music*, short form of operatic air, of a soft character, differing from the ordinary aria in consisting only of one part, and that spun out more in the form of a song. Modern composers have, however, disregarded this difference. Rossini mixes both. Weber, in his operas, adds an introduction or a recitative.

CAVAZION—CAVENDISH.

The most perfect specimen of the C. is that in Meyerbeer's opera of *Robert the Devil*.

CAVAZION, n. *kǎ-vǎ'zhǎn* [It. *cavazione*, excavation]: in *arch.*, an excavation for the foundation of a building or for cellarage.

CAVE, n. *kāv* [F. *cave*—from L. *cāvus*, hollow: Fin. *koppa*, anything hollowed or vaulted]: a hollow place under earth or rocks, as at the side of a hill; a den; a cavern: V. to hollow or scoop out; to dwell in a cave; (followed by IN), to fall in, as earth in digging a pit. CA'VING, imp. CAVED, pp. *kāvd*. CAVITY, n. *kāv'ī-tī*, a hollow in anything. CAVE-EARTH, the reddish calcareous earth accumulated in anc. caverns. CAVE-BEAR, CAVE-LION, etc., extinct animals whose bones are found fossil in caverns.

CAVE, *kāv*, EDWARD: 1691–1754, Jan.; b. Newton, Warwickshire, England: founder of the *Gentleman's Magazine*, the first literary journal of the kind. He obtained a good education at Rugby; and after many vicissitudes, became apprentice to a printer. Obtaining money enough to set up a small printing-office, he projected the *Gentleman's Magazine*, which has now existed more than a century and a quarter. He was the friend and early patron of Samuel Johnson.

CAVE, WILLIAM: 1637, Dec.—1713, Aug. 4; b. Pickwell, Leicestershire, England: clergyman and scholar. He studied at Cambridge; was appointed to the vicarage of Islington 1662; afterward to the rectory of Allhallows the Great, London; and in 1690 to the vicarage of Isleworth, Middlesex. He died at Windsor. He was the author of many religious works, the most important being the *Lives of the Apostles*, *Lives of the Fathers*, and *Primitive Christianity*, which were standard works.

CAVEAT, n. *kǎ'vī-ăt* [L. *cavēāt*, let him beware]: in *law*, a judicial warning or caution; intimation to stay proceedings; consisting in an intimation by the party interested to the proper officer, to prevent him from taking any step without such intimation being made to the said party as shall enable him to appear and object. CA'VEĀTOR, n. one who. CAVEAT EMPTOR [Latin]: notice to a buyer that he must beware or be watchful concerning his rights.

CAVENDISH, *kāv'ēn-dīsh*, FREDERICK CHARLES, Lord: 1836–82, May 6; second son of the Duke of Devonshire and Lady Blanche Howard. He was educated at Trinity College, Cambridge, was private sec. to Earl Granville 1859–64, and M.P. for the northern division of the West Riding 1865–82. He married the second daughter of Lord Lytton 1864. He acted as private sec. to Mr. Gladstone for a brief period in 1872, and was made a lord of the treasury 1873. He was appointed chief sec. for Ireland on William E. Forster's retirement, 1882, Apr. A few weeks later he was murdered with Mr. Burke, the under-sec., while walking in Phoenix park adjoining Dublin castle, in broad daylight, between 7 and 8 P.M. The crime excited profound sensation in Europe and America, and the murderers escaped detection for some months, but were brought to

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justice 1883, Jan. Lord C. was of amiable character, highly esteemed, and newly in office; the plot which proved fatal to him was laid against Mr. Burke, an old official.

CAVENDISH, HENRY: natural philosopher: 1731, Oct. 10—1810, Feb.; b. Nice, Italy; son of Lord Charles C., and nephew of the third Duke of Devonshire. He studied at Cambridge, and applied himself through life to scientific investigations. Wealth, bequeathed to him by an uncle, enabled him to follow uninterruptedly his favorite pursuits. He almost secluded himself from the world, and was so averse to meet with strangers that he had his library—a magnificent one—built at a distance from his house, so that he might not encounter persons coming to consult it; and his female domestic servants had orders to keep out of his sight, on pain of dismissal. His dinner he ordered daily by a note placed on the hall-table. He died unmarried, leaving considerably more than a million sterling to his relatives. As a philosopher, C. is entitled to the highest rank. To him it may almost be said is due the foundation of pneumatic chemistry, for prior to his time it had hardly an existence. In 1760, he discovered the extreme levity of inflammable air, now known as hydrogen gas—a discovery which led to balloon experiments, and projects for aërial navigation; and, later, he ascertained that water resulted from the union of two gases—a discovery, however, to which Watt (q.v.) is supposed to have an equal claim. The accuracy and completeness of C.'s processes are remarkable. So high an authority as Sir Humphry Davy declared, that they 'were all of a finished nature, and though many of them were performed in the very infancy of chemical science, yet their accuracy and their beauty have remained unimpaired.' C. wrote also on astronomical instruments; and his *Electrical Researches* (1771–81) were edited by Prof. Clerk Maxwell (1879).

CAVENDISH, MARGARET, Duchess of Newcastle: second wife of William, Duke of Newcastle; b. about the end of the reign of James I., d. 1673: remarkable instance of a person afflicted with the *cacoëthes scribendi*, who had no capacity whatever for writing. She produced no less than 13 folio vols., 10 of which were printed, treating, indifferently, on all subjects in prose and poetry, and careless in all, both as to grammar and style. Her mania for scribbling kept up her maids at night, so that, if she chanced to wake with anything on her mind, they might be ready to note it down at once.

CAVENDISH, THOMAS: 1560–92: navigator; b. Trimley St. Martin, Suffolk. He spent a short time at Corpus Christi College, Cambridge, and left to live at court. Having spent his patrimony, he fitted out a ship and went to Va., 1585, with Sir R. Grenville. 1586, July 1, he sailed from Plymouth with three vessels of 120, 60, and 40 tons; entered the Straits of Magellan, 1587, Jan. 6, spent a month there; cruised along the coasts of Chili, Peru, and Mexico, destroying sundry towns and 19 ships, and off the California coast took the 700-ton galleon *Santa Anna*, belonging to the

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Spanish king, with a rich cargo in goods and money. Returning with his booty by the Cape of Good Hope, he reached Plymouth 1588, Sep. 9, having circumnavigated the globe in less time than either of his predecessors; it is said that his topmast was covered with cloth of gold, his sails of damask, and the sailors clad in silk. 1591, Aug. 26, he started again with five ships, but fortune had deserted him; his crews mutinied and compelled him to return, and he died of grief off the coast of Brazil. He had discovered and named the harbor of Port Desire on the e. coast of Patagonia. He wrote a *Voyage to Magellanica* in 1586.

CAVENDISH WILLIAM, Duke of Newcastle: distinguished loyalist of the 17th c.: 1592–1676, Dec. 25, son of Sir Charles C., younger brother of the first Earl of Devonshire. His learning and winning address made him a favorite at the court of James I., who, 1610, made him a knight of the Bath. Other honors rapidly succeeded. In 1620, he was made a peer of the realm. Charles I., about 1628, gave him the title of Earl of Newcastle-upon-Tyne, and 1638 intrusted him with the tuition of his son, afterward Charles II. His support of the king during the contest with the parliamentary forces was munificent. He contributed £10,000 to the treasury, and raised a troop of 200 knights and gentlemen, who served at their own cost. As general of all the forces raised north of the Trent he had power to issue declarations, confer knighthood, coin money, and raise men; and the last part of his commission he executed with great zeal. The banquets C. gave the king when he went north were magnificent enough to find record in history; one of them cost no less than £15,000, even in those days when money was more valuable than now. After the battle of Marston Moor, C. retired to the continent, where he resided, at times in great poverty, until the restoration. On his return, he was created Duke of Newcastle. On the continent, he applied himself to literature, and wrote a book on the management of horses, and several plays, not of a character to increase any man's reputation for intelligence.

CAVENDISH COLLEGE: founded at Cambridge, England, 1873, named after William Cavendish, Duke of Devonshire, and chancellor of the Univ. of Cambridge. It was founded by a joint-stock company, the County College Association. Its object is to enable young men to pass through a university course at an earlier age and at less expense than in the older colleges of the university, and thus especially to benefit those preparing for the church or for teaching. Nine trustees hold office for life. Vacancies are filled by nominations of the shareholders, subject to approval by the surviving trustees. The trustees are *ex officio* members of the board of directors, with nine others annually elected.

The erection of the present buildings was begun 1876. There are accommodations for 300 students, who, as a rule, may go to reside in the college at the age of 16. The annual cost of attendance is not to exceed 80 guineas. The chancellor of the univ. is the pres. of the college.

CAVENDISH'S EXPERIMENT: see EARTH.

CAVERN—CAVES.

CAVERN, n. *kāv'èrn* [F. *caverne*—from L. *caver'na*, a cavern—from L. *cāvus*, hollow]: a large hollow place below the earth or rocks; a *cavern* is larger than a *cave*. CAVERNED, a. *-èrnd*, or CAVERNOUS, a. *kāv'èrn-ūs*, full of caverns. CAVERNOUS, a. *kāv'èrn-ūs*, or *kāv-èrn'ūs*, in *med.* in *anat.*, with cavities. CAVERNULOUS, a. *kā-vèrn'ū-lūs*, full of little caves or hollows.

CA'VERY: see CAUVERY.

CAVERYPOR'AM: see CAUVERIPURAM.

CAVES, or CA'VERNS: hollow spaces in the earth; natural or artificial. Natural C. have been produced by the fracture and dislocation consequent on the upheaval of the strata, by water, or by both causes combined. The denuding or eroding power of water, which has produced the materials of stratified rocks, has formed caverns in the courses of rivers and on the coast-line of the sea. The moving waters, carrying with them gravel and sand, enter natural cracks and crevices, and, by abrading their walls, increase their size, so as to form C.; or they attack less indurated portions of the solid strata, and form cavities bounded by the harder rock. Such caverns are numerous on many coasts, and indicate an ancient sea-margin. In limestone rocks, the destroying power of water is increased when it contains chemical agents which have the power of dissolving the substance of the rock, and so causing it to be carried off in solution by the water.

C. are most frequent in limestone rocks. They especially abound in the oolitic limestone, on this account called by the earlier continental geologists 'cavern limestone.' The celebrated C. of Franconia in Germany, the Mammoth C. of Kentucky, the C. of Kirkdale in Yorkshire, England, and many others, occur in this formation. Next to limestone, the triassic measures, containing rock-salt, a material easily removed by water, most abound in caverns. They are frequent also in igneous rocks—the picturesque cave of Fingal, in Staffa, is formed in basalt; and in S. America and Iceland the modern lava contains large caverns.

Many caverns have a calcareous incrustation lining their interior, giving them a gorgeous appearance when lights are introduced. Sometimes this deposit is pure white, and has exceeding richness and transparency. It is, however, generally colored by the impurities which the water has taken up from the superincumbent strata. To the incrustations suspended from the roof, like icicles, the name stalactite is given, while those rising from the floor are designated stalagmites. Sometimes the pendent stalactite is produced so as to meet the ascending stalagmite, and form pillars, as if to support the roof, as in the 'Organ' in the Blue John mine, Derbyshire. The source and origin of this deposit has been satisfactorily explained by Liebig as follows: The mold of the superficial soil, acted upon by moisture and air, evolves carbonic acid, which is dissolved by rain. The rain-water thus impregnated, permeating the calcareous strata, has the power of taking up a portion of the lime, which it retains in a liquid condition, until from evaporation the excess of carbonic acid is parted with, when the lime again returns to its solid state, and forms the incrustation.

CAVESSON.

C. have additional interest to the geologist from the occurrence in many of them of osseous remains under the calcareous incrustations of the floor. The bones are imbedded in mud, and frequently concreted into a firm calcareous breccia. They belong to the pleistocene period, when the C. in Europe were inhabited by large hyenas and bears. Portions of other animals inhabiting the neighborhood were dragged by them into their dens, as food. In these pleistocene caves, besides many species of mammals and birds still common in these climes are found many species which have long since disappeared from Europe. Thus the British caves show remains of cave-lions, cave-bears, hyenas, mammoths, woolly rhinoceroses, besides wolves, grizzly bear, bisons, and reindeer. Among the more notable ossiferous caverns of Britain belonging to this paleolithic age, are those of Kirkdale, 25 m. from York, where the remains of 300 hyenas were found, as well as the gnawed bones of the animals they had preyed on, including the mammoth, bison, rhinoceros, and horse; there are ossiferous C. also in the carboniferous limestones of Glamorganshire; others are in Somerset, Derbyshire, and Devon.

But besides the pleistocene caves, there are other prehistoric caves which show many interesting traces of occupation—not merely of wild animals but of men and of domestic animals. These may be divided into three groups, according as the remains point back to the neolithic, bronze, or iron ages. Neolithic caves have been found in France, Spain, Belgium, and in North Wales; and show the polished celts or flint implements characteristic of the period, rude pottery, human skeletons, and bones of domestic animals. Relics of the bronze age are not found in many caves, but have been met with—as in the caves of Staffordshire and Glamorgan. Iron implements have been found in not a few caves. It should be added that some of the pleistocene caves have been occupied by man in neolithic and later times.

Ossiferous C. occur in all parts of the globe. The fossils of those in Australia show that the fauna of the pleistocene period had a remarkable resemblance to that of the present day. The remains consist chiefly of kangaroos and allied genera of marsupials.

Caves have been inhabited also in historic times, not only in savage countries, but in Britain also. To this period belong the remains found in Victoria cave, explored by the Settle cave committee since 1869, and containing among many other interesting remains, Roman and other coins, Celtic brooches, and broken pottery. Some caves in Scotland, as on the coast of Fife and elsewhere, were regarded as sacred, and are associated with the names of ancient Christian saints—either as their dwellings or as chapels.

See KENT'S CAVERN: for the cave men, see MAN: FLINT IMPLEMENTS: for the cave-dwellers known to the ancients, see TROGLODYTES: PETRA: for the Indian cave-temples, see ELEPHANTA: ELLORA.

CAVESSON, n. *kāv'ēs-sōn*, or CAVEZON, n. *kāv'ē-zōn*, and CAUSSON, n. *karts'sōn* [*F. caveçon*, and *cavesson*, an iron

instrument placed on the lip of horses: Sp. *cabezon*, a nose-band]: a particular kind of nose-band put upon an unruly horse to assist in breaking him in.

CAVETTO, n. *kă-vět' tŏ* [It.—from *cavo*, hollow]: in *arch.*, a hollow molding used principally in cornices.

CAVIANA, *kă-ve-â'nâ*: island of Brazil, at the mouth of the Amazon, under the equator. It is triangular in shape, 35 m. long and 20 m. wide, level, fertile, and stocked with cattle. On the s.e. side is a small town, Roberdello.

CAVIARE, n. *kăv'î-âr* [F. *caviar*; OF. *cavial*, caviare—from It. *caviale* and *caviaro*: Turkish *havyâr*: mod. Gr. *kabiârî*]: a prepared article of food consisting of the salted roes of several kinds of large fish, chiefly of the common sturgeon, *Accipenser Sturio* (see STURGEON); something that cannot be appreciated or understood by the people, from the fact of the disagreeable flavor of *caviare* to an unaccustomed palate. C. is prepared chiefly in Russia, where it is greatly esteemed as food. It is used also in Italy and France. The species of sturgeon from the roe of which chiefly it is prepared, inhabit the Caspian and Black seas and their tributary rivers. Among them are the bielaga, or great sturgeon (*Accipenser Huso*), the osseter (*A. Guldenstadti*); the scherg or sevruga (*A. stellatus*), and the sterlet (*A. Ruthenus*). The C. made from the roe of the last-named species is esteemed particularly delicious, and is reserved for the Russian court. Astrakhan is a principal seat of the preparation of C. More than 400,000 lbs. of C. have been prepared in the Caspian fishery in a single year. CAVIARE TO THE GENERAL (the taste for *caviare* being not natural but acquired), anything which is beyond the taste and appreciation of the people.

CAVICORNIA, n. plu. *kăv'î-kŏr'nî-ă*, or CAV'ICORNS, n. plu. *-kawrnz* [L. *căvus*, hollow; *cornu*, a horn]: the hollow-horned ruminants, in which the horn consists of a central bony core, surrounded by a horny sheath, as in the ox, sheep, or antelopes.

CAVIL, v. *kăv'îl* [L. *cavillor*, I taunt—from *căvus*, hollow: OF. *caviller*, to wrangle]: to raise frivolous objections; to find fault unreasonably; to wrangle; to carp at: N. a false or frivolous objection.

CAVITE: a small seaport of Luzon, Philippine Islands; about 11 miles s. w. of Manila, and fronting directly on the bay; pop. (1899) 9,484. The history of Cavité commences almost simultaneously with the first occupation of the Philippines by the Spaniards who fortified it strongly. These works subsequently were allowed to fall into decay, and the town became a place of minor importance. Prior to the great battle in Manila bay Admiral Dewey boldly steamed past Cavité, which was supposed to be strongly fortified. Immediately after the defeat of the Spanish, the Americans occupied the town, and on the arrival of troops its works were strengthened, and it was made a naval and military base. The town gives its name to a province. Pop. 134,500. The latter was created under the "provincial government act," 1901, Feb. 6.

CAVOR, or CAVOUR, *kă-vor'*, or *kă-vôr'*: town of n.

CAVO-RELIEVO—CAVOUR.

Italy, at the foot of the Alps, 7 m. s.s.e. of Pinerolo. It has manufactures of silk-twist, linens, leather, etc., and marble and slate quarries. Pop. 6,000 or 7,000.

CAVO-RELIEVO, n. *kāv'ō-rě-lēv'ō* [It., hollow-relief]: figures carved or indented into a surface, instead of being raised upon it; intaglio. In this peculiar kind of relievo, which was extensively employed by Egyptian artists, the highest surface of the object represented is only on a level with the plane of the original stone, the rounded sides being cut into it. The effect resembles that of a concave seal. It is correctly described as *intaglio rilievato*. A wood-cut is given in Fairholt's *Dictionary of Terms in Art of the Egyptian king Amunoph III. in hieroglyphics*.

CAVOUR, *ka-vôr'*, CAMILLA BENSO DI, Count: descendant of a noble and wealthy family of Piedmont; 1810, Aug. 10—1861, June; b. Turin; Italian statesman. He was educated for a military career, but his liberal tendencies being likely to prove an insuperable barrier to his promotion, he retired during the stirring events of 1830-31, and engaged in agriculture, in which he introduced great improvements. He was the first to use guano in Piedmont; and, at his instigation, a national agricultural society was formed. During a residence in England he made himself intimately acquainted with the political organization of the country, and with its industrial institutions. He returned to Italy, 1842, and in conjunction with Count Cesare Balbo, he in 1847 established a political daily journal, in which he advocated the interests of the middle classes—a representative system, somewhat after the pattern of the English constitution, as opposed alike to absolutism on the one hand and mob rule on the other. On his suggestion the king was petitioned for a constitution, which was granted, 1848, Feb. As a member of the chamber of deputies during the stormy period which succeeded Charles Albert's declaration of war against Austria in March, C. strenuously opposed the ultra-democrats, and counselled an alliance with England as the surest guarantee for the success of the Italian arms. In the Marquis d'Azeglio's ministry, formed soon after the fatal battle of Novara, C. was successively minister of agriculture and commerce, minister of marine, and minister of finance; and in 1852, he was appointed to succeed d'Azeglio as premier. From this time until his resignation in 1859, in consequence of the conclusion of the peace of Villafranca, C. was the originator as well as the director of the Sardinian policy. Taking upon himself at different times, in addition to the premiership, the duties of the ministers of finance, commerce, and agriculture, and latterly of home and foreign affairs, he greatly improved the financial condition of the country, introduced free-trade, consolidated constitutionalism, weakened clerical influence, and made Sardinia a power of some account in Europe, by bringing her into alliance with England and France against Russia. The dispatches which C. penned in reply to those of Austria, prior to the outbreak of the Italian war, are on all hands acknowledged as master-pieces of astute diplomacy. In

CAVY

1860, Jan., C. was again called to preside over the Sardinian government, the duties of foreign minister likewise devolving upon him, and temporarily those of the minister of the interior also. He continued to direct the Sardinian policy until his death. Count C.'s name will live in history as the pure-hearted, broad-minded, and sagacious leader on the field of statemanship and diplomacy for the reviving and reunited Italy.

CAVY, n. *kā'vī* [new L. *caviā*—from Brazilian *cabiai*]: *Cavia*; genus of quadrupeds of the order *Rodentia*, regarded as the type of a family, *Caviæ*, differing from the Hare family (*Leporida*) in the complete want of clavicles, in the want of growing roots to the molar teeth, and in having the incisors situated as in other quadrupeds generally, and not in the peculiar manner characteristic of the hares. There are four molar teeth in each jaw, and in the genus C. these are compound; and the genus is further characterized by four toes on each of the fore-feet, and three on each of the hind-feet, by the feet not being webbed, by the females having only two teats, and by the want of a tail. One species, *Cavia Cobaya*, has long been well known as a domesticated animal, and has been a common pet and plaything of children in Europe, almost from the time of the discovery of America. It is called sometimes the COMMON C. or RESTLESS C., but much more frequently the GUINEA-PIG, though it is neither nearly related to pigs nor a native of Guinea. Perhaps *Guinea*, in this name, may be a corruption of *Guiana*, the cavies, and indeed the whole family of the *Caviæ*, being exclusively S. American. The colors which the domesticated C. exhibits have never been seen in any of the wild cavies of S. America; and as it is known to have exhibited the same variations of color from about the time of its introduction into Europe, it is supposed to have been long domesticated by some S. American tribes. The Guinea-pig multiplies with a rapidity exceeding that of any other known quadruped, producing young ones when only two months old, and afterward at intervals of two months,



Cavy, or Guinea-pig.

and from four to twelve in a litter. This extraordinary fecundity is probably not so much the result of domestication as a provision for the preservation of the race in a wild state, the little animal being very defenseless and destitute of means of escape, the ready prey of every carnivorous beast and bird.—The other species of C. much resemble the

CAW—CAWNPORE.

Guinea-pig. Some of them are very numerous in some parts of S. America, and are sought for food, although no such use is made of the domesticated cavy. The agouti (q.v.) and the capybara (q.v.) are ranked among the *Cavidae*.

CAW, v. *kaw* [from the sound: Dut. *kaa*; Sw. *kaja*, a jackdaw]: to cry like a crow or rook. CAW'ING, imp. CAWED, pp. *kawd*.

CAWASS, properly KHAWASS, n. *kow-ās'* [Ar.]: in the *East*, an attendant; a messenger; a domestic; a grandee; a minister of state: another spelling is CAVASS n. *kā-vās'*, in *Turkey*, a police officer.

CAW'DOR, or CAL'DER: parish in Scotland, 4 m. sq., chiefly in co. Nairn, but partly in Inverness. It contains C. castle, in which, according to tradition, Macbeth, thane of C., murdered King Duncan; the murder, however, dates back to the 11th c. while the castle was built in the 15th. In it Lord Lovat was sheltered after the Pretender's overthrow, 1745.

CAWK, n. *kawk* [prov. Eng. *cauk*: comp. *calc*, in *calc-sinter*]: familiar term for a massive variety of heavy spar or native sulphate of baryta (see BARYTA). CAWK'Y, a. -y, like cawk or pertaining to it.

CAWNPORE: district of the city of C., in the lieut.-governorship of the N.W. Provinces. Occupying the entire breadth of the Doab, it touches at once the Jumna and the Ganges; while to the e. it has Futtehpore, and to the w. Etawah and Furruckabad; 2,370 sq. m., in lat. from 25° 55' to 27° n., and in long. from 79° 34' to 80° 37' e. It is an alluvial plain of great fertility. The vine is cultivated and indigo grows wild. Besides its two mighty rivers and their navigable tributaries the Ganges canal traverses the country for about 60 m. Pop. (1881) 1,181,396; (1891) 1,209,695.

CAWNPORE, *kawn-pōr'*, or KHANPUR: city of the Doab, on the right bank of the Ganges, about 140 m. above Allahabad, at the junction of the Jumna, being separated by the river from Oude, whose cap., Lucknow, lies 53 m. n.e. C. is in lat. 26° 29' n., long. 80° 25' e. The stream in front, varying, according to the season, from 500 yards in width to more than a mile, presents a large and motley assemblage of steam-vessels and native craft. C., at least as a place of note, is recent, being indebted for its growth, besides its commercial facilities, partly to military and political considerations. In 1777, being then an appendage of Oude, it was assigned by the nawab as the station of a subsidiary force; and in 1801 it became, in name as well as in fact, British property. Its cantonments, having accommodation for 7,000 troops, have gradually accumulated about 50,000 native inhabitants, while the city itself contains a somewhat larger population of similar origin. During the mutiny of 1857 C. was the scene of Nana Sahib's massacre of his English captives. Though C. is only 379 ft. above the sea, yet, during winter, considerable quantities of ice are made for preservation, through the exposing of water by night in shallow vessels. Pop. (1901) 197,170.

CAXAMARCA—CAXTON.

CAXAMARCA, or **CAJAMARCA**, *kâ-ĉhâ-mâr'ká*: prov. in the n.w. of Peru, with a cap. of its own name. It is on the e. side of the Andes, forming part of the basin of the Marañon. Pop. 442,412, and the city about 8,000.

CAXAMARCA, or **CAJAMARCA**, *ka-ĉhâ-mâr'ka*: city of Peru, cap. of prov. of C., dept. of Truxillo; lat. 7° 7' s., long. 78° 31' w.; on the e. side of the western Andes, in a fertile valley on the Erizneja, 72 m. n.n.e. of Truxillo, abt. 9,060 ft. above the sea. Its streets are wide and regular, but the houses are built of clay. It has a fine parish church., supplied by Charles II. of Spain, a church of San Antonio, a Franciscan monastery, a nunnery, and the remains of the palace of Atahualpa, the last Inca put to death here by the Spaniards 1533. The Inca's baths, or sulphur springs of Pultamarca, e. of the town, have a temperature of 156° F., and are much used. C. has manufactures of woolen and linen cloth, steel, silver, and biscuits; a good trade with Truxillo, and a railroad to the port of Pacasmayo. Pop. abt. 12,000.

CAXAMARQUILLA, *kâ-ĉhâ-mâr-kêl'yâ*: town of n. Peru, province of Libertad, 100 m. e.n.e. of Truxillo. Pop. abt. 10,000.

CAXATAMBO, or **CAJATAMBO**, *kâ-ĉhâ-tâm'bô*: town of n. Peru, province of Ancachs, 120 m. n.n.e. of Lima. There are silver-mines in the neighborhood. Pop. abt. 2,000.

CAXTON, *käks'ton*, **WILLIAM**: abt. 1422—abt. 1491; b. in the Weald of Kent. He introduced printing into England. The particulars of the life of this great benefactor of his country are scanty. He was apprenticed 1439 to Robert Large, a wealthy London mercer. At the death of the latter, 1441, he went to Bruges, where 1462 or '3 he seems to have become gov. of a chartered association of English adventurers trading to foreign parts. In 1471 C. entered the service of Margaret, Duchess of Burgundy, formerly an English princess; and apparently toward the end of 1476 he set up his wooden printing-press at the sign of the red pale in the almonry at Westminster. The art of printing he had acquired during his sojourn in Bruges, doubtless from Colard Mansion, a well-known printer of that city; and in 1474 he put through the press the first book printed in the English tongue, the *Recuyell of the Historyes of Troye*, a translation of Raoul le Fevre's work. The *Game and Playe of the Chesse* was another of C.'s earliest publications; but the *Dictes and Notable Wise Sayings of the Philosophers*, published 1477, is the first book which can with certainty be maintained to have been printed in England. All the eight founts of type from which C. printed may be called black letter. Of the 99 known distinct productions of C.'s press no less than 38 survive in single copies or in fragments only. C., who was an accomplished linguist, and translated many of the works that issued from his press, was diligent in his craft or in translation till within a few hours of his death, which seems to have been about the close of 1491. In 1877 the printer and his work were fittingly commemorated by a typographical exhibition in

CAYAMBE--CAYUGA LAKE.

London. See *The Old Printer and the New Press*, by Charles Knight (1854); *Life and Typography of William C.* (1861-63), by W. Blades; and the *Biography and Typography of C.* (1877), by the same author.

CAYAMBE, *kī-ām-bā*, or CAYAMBE-URCU, *kī-ām-bā-ór-kō'*: a peak of the Andes, in Ecuador, under the equator, 45 m. n.e. of Quito. Its snow-crowned head, 19,541 ft. high, and fine conical form make it one of the landmarks of the globe.

CAYCOS, or CAYOS, or THE KEYS: see CAICOS.

CAYENNE, n. *kā-yě'n'* or *kā-ě'n'*: a very strong pungent pepper of a red color that comes from *Cayenne*, S. America; the dried powdered pods and seeds of different species and varieties of *Capsicum*, ord. *Solanaceæ*: ADJ. pertaining to: see CAPSICUM.

CAYENNE, *kā-ě'n'* or *kī-ě'n'*: fortified seaport, cap. of French Guiana, on the w. point of an island of C. at the mouth of the river Oyak. The roadstead is excellent, and the port commodious but shallow. C., though it is the entrepôt of all the trade of the colony, is known chiefly as a great French penal settlement. The island, 32 m. in circumference, is separated from the mainland by a narrow channel; its soil is fertile, but the climate is extremely unwholesome for Europeans, large numbers of the convicts having died by various malignant fevers. C. became a French colony about 1635; deportation hither began during the first French revolution. Pop. abt. 8,000.

CAYENNE' CHER'RY: see EUGENIA.

CAYMAN, or CAIMAN, n. *kā'măn* [negro name]: the American alligator. The name C. is variously used, either as the distinctive appellation of some, or as a common name for all the *Crocodylidae* of S. America: see ALLIGATOR. The genus *Alligator* is by some naturalists of the present day divided into three genera, to one of which the name C. (*Caiman*) is appropriated, and of which the type is the species called the Eyebrowed C. (*Alligator palpebrosus*), to which the name C. is distinctively applied in Surinam and Guiana, a species very abundant there, but not one of the largest or more dangerous of its tribe. It is remarkable for the three bony plates, separated by sutures only, which form each eyebrow or eyelid, projecting as large knobs, like a man's fist; and this, and the scarcely webbed-feet, constitute the most important characters of the genus or sub-genus Cayman. To this sub-genus belong also *A. trigonatus*, regarded by Cuvier as a mere variety of the same species, and *A. gibbiceps*.

CAYMANS, *kī-mănz'*, in English, *Alligators*: three low islets of the Caribbean Sea, which form a dependency of Jamaica, being 130 m. n.w. of it. Discovered by Columbus, they were by him called Tortugas, from the abundance of turtle—still the staple production of the group. Area abt. 2,000 acres. The soil yields corn and vegetables; and the people rear hogs and poultry. Pop. 1,500 or 1,600.

CAYUGA LAKE, *kā-yō'ga*: boundary between Cayuga

CAYUGAS—CAZEMBÉ.

and Seneca counties, N. Y., and extending s. into Tompkins co.; 33 m. long., 1 to $3\frac{1}{2}$ m. wide. It is navigable throughout and seldom frozen over, except at the n. end, which is rather shallow; elsewhere it is believed to attain a depth of 500 ft. or more. Its surface is 377 ft. above the sea, and 146 ft. above Lake Ontario, into which its waters flow through the Seneca and Oswego rivers. Its banks are formed of Silurian and Devonian rocks. Steamers ply from Ithaca at its head to C. bridge at its foot.

CAYUGAS: a tribe of the Iroquois or Six Nations. They called themselves Gwengwen or Goiogwen, and occupied villages on Cayuga Lake, N. Y. They numbered some 300 warriors when first known to the French, who in vain attempted to conciliate them, and conducted missions among them, 1556–84, with little result. One of their chiefs, however, Saonchiogwa, was converted 1671, and another, Tawerahet, was taken to France and became friendly. The tribe took arms against the Americans at Point Pleasant 1774, and during the revolution fought for the British; their villages were destroyed for harassing Gen. Clinton 1779 on his march to join Sullivan. After the war they ceded to N. Y. all their land except a small reservation, which they gave up in 1800, and scattered among other tribes. Their language is now nearly extinct, and their numbers reduced to about 250, some of whom are at the Seneca reservation in Erie co., 20 m. s. of Buffalo.

CAZALLA DE LA SIERRA, *ká-thál'yá dā lá sē-ěr'rá*: town of Spain, province of Seville, 39 m. n.e. of the city of Seville. It is on a declivity of the Sierra Morena; the district around is mountainous and well wooded, and abounds in minerals of various kinds, including iron, silver, copper, sulphur, and marble. The inhabitants, numbering between 7,000 and 8,000, are chiefly employed in smelting metals, manufacturing cannon, machinery, and agricultural implements. Tanning, weaving, etc., are done. Pop. between 7,000 and 8,000.

CAZEMBÉ, or **KAZEMBÉ**, *ká-zēm'bé*: official and hereditary name of an African chief; thence used to designate his people and territory, between 11° and 9° s. lat., s. of lake Moero and n. of Bangweolo. His authority, which 90 years ago prevailed far and wide, has shrunk till it covers an estimated area of but 120,000 sq. m. and a pop. of 500,000. The native race, the Messiras, has been conquered and kept down by the Campolólas, who alone are eligible to office; theirs is the court language. The C. is an absolute monarch, with 600 wives. The polygamy of his subjects is limited only by their means. The country is a well-watered plain. The chief river, the Luapula, flows from Bangweolo to Moero, and was supposed by Cameron to be one of the head waters of the Congo. Millet, maize, manioc, sugar-cane, yams, gourds, and bananas, are cultivated; the horse and ass are unknown and sheep scarce, but cattle common. Salt is found in several places; coarse cotton-cloth, earthenware, and iron are manufactured; and ivory, copper, and slaves, exported. C. was visited 1796 by Pe-

CAZENOVIA—CEBES.

reira, 1798 by Lacerda, and 1802 by Baptista and José, agents of Da Costa. A Portuguese official sent an embassy under Monteiro, 1831. Livingston was there 1868, and found the capital, which changes on the accession of each new ruler, at Useмба or Lunda, near Lake Mofwe.

CAZENOVIA, *kăz-ên-ô'vî-a.* village of Madison co., N. Y., on the small lake of C., 18 m. s.e. of Syracuse, with which it is connected by the Syracuse and Chenango Valley railroad; it is connected also with the N. Y. Central railroad, 15 m. n., by the C. and Canastota railroad. It has several mills, a bank, and a newspaper, and is the seat of a seminary supported by the Central N. Y. Meth. Epis. Conference. Pop. (1870) 1,718; (1800) 1,918; (1900) 1,819.

CAZIQUE, n. *kă-zêk'* [native or Amer. name]: a W. I. or Amer. chief; also spelled CACIQUE and CAZIC.

CAZONS, n. plu. *kă'zônz*, or CASINGS, n. plu. *kă'zîngz* [F. *gazon*, turf, sod: OF. *wason*—from O.H.G. *waso*]: in OE., dried cow-dung in masses used as fuel; oblong pieces of dried turf or peat used as fuel.

CAZORLA, *kâ-thôr'lá*: town of Andalusia, Spain, 40 m. e.n.e. of Jaen. C., which is a place of considerable antiquity, is pleasantly situated on a declivity, and is well-watered by the Vega; has two old castles—one an Arab structure—manufactures of leather, earthenware, soap, and bricks, and a trade in agricultural produce. Pop. 7,500.

CEANO'THUS see RED ROOT.

CEARA, *să-ă-rá'*: province of Brazil, on the n. coast, lat. 2° 40'—7° 25' s., long. 37° 40'—41° 30' w.; 40,253 sq. m. It abounds in balsams, gums, resins, and fruits; and among its minerals are gold, iron, copper, and salt. The port of C. had a trade with Great Britain in 1874 amounting to £969,584. Pop. of C. (1872) 700,000; (1890) 805,687.

CEASE, v. *sēs* [F. *cesser*, to cease—from L. *cessārē*, to delay, to cease: It. *cessare*, to dismiss]: to leave off, followed by 'from'; to stop; to fail; to be at an end. CEAS'ING, imp. CEASED, pp. *sēst*. CEASE'LESS, a. without a stop or pause; incessant; endless. CEASE'LESSLY, ad. *-lî*. CESSATION, n. *sēs-sî'shûn*, a stop; a pause; a leaving off. CEASE AND DETERMINE, in *law*, said of an estate or right granted during a certain period, when such comes to an end.

CEBADIL'LA: see SABADILLA.

CEBES, *sê'bēz*: Greek philosopher, of Thebes in Bœotia; a disciple of Socrates. Plato introduced him in the *Phædo*, and Xenophon called him eminent for virtue and love of truth. He is remembered by the *Pinax* (picture) or *Tabula Cebetis*, a didactic dialogue professing to explain an allegorical picture. It starts with the Platonic doctrine of a pre-existent state, wherein men had been taught how to live on earth, but a draught of oblivion, taken in different degrees, obscures or erases the lesson; they are tempted, but may overcome by fortitude and patience. The sciences, grammar, geography, arithmetic, geometry, and music, are not the true discipline, but useful as restraints to youth. Some,

CEBU—CECIL.

from passages probably interpolated, have credited this work to another C., a stoic of 500 or 600 years later. The *Table* has been translated into most languages, and is often printed with Epictetus's *Enchiridion*. Salmasius published the text with Latin and Arabic versions 1640. Laertius and Suidas credit C. with two other dialogues now lost. *Hebdome* (the Seventh) and *Phrynichus*.

CEBU, or ZEBU (island): see PHILIPPINE ISLANDS.

CEBU (city): see ZEBU.

CEBUS, *sē'bus* [Gr., an ape or monkey]: genus of American monkeys, characterized by a round head and short muzzle, a facial angle of about 60°, long thumbs, and a long prehensile tail entirely covered with hair. The species are numerous, all of very lively disposition and gregarious habits, living in trees. They feed chiefly on fruits, but also on insects, worms, and mollusks. They are included under the popular designation SAPAJOU in its wider sense, and some of them are the monkeys to which this name is sometimes more strictly appropriated. The names SAJOU and SAI are also given to some of them, and some are called Capuchin (q.v.) monkeys. One of the most common species in Guiana is the WEEPER MONKEY, or WEEPER SAPAJOU (*C. Apella*).—The name Capuchin is perhaps most frequently given to *C. Capuchinus*, a brownish species, with head, feet, and hands generally black, and front, shoulders, and cheeks whitish.—Some of the species of *C.* are adorned with beards. The name *Cebidæ* is sometimes given to the American monkeys collectively, as a family or tribe. See MONKEY.

CECIDOMYIA, *sē-sī-dō-mī'ya* [Gr. *kekidion*, a gall-nut; and *myia*, a fly or gnat]: genus of dipterous (two-winged) insects of the family *Tipulariæ*—the gnat and mosquito family; having downy wings, which have three nervures, and are horizontal when at rest; antennæ as long as the body, with bead-like joints, and whirls of hairs at the joints; long legs, and the first joint of the tarsi very short. The species are numerous. All are of small size, but some of them are very important on account of the ravages which their maggots effect in grain-crops. *C. cerealis*, sometimes called the barley midge, a brownish-red fly with silvery wings, of which the maggot is vermilion-colored, is often very destructive to crops of barley and spelt in Germany. The little maggots live in families between the stalk and the sheath of the leaf, abstracting the juice of the plant.—The Wheat-fly (q.v.) and the Hessian Fly (q.v.) belong to this genus.—Some of the species of *C.* deposit their eggs on the young buds of trees, which the larvæ transform into galls.

CECIL, *sēs'il* or *sīs'il*, RICHARD: 1748, Nov. 8—1810, Aug. 15; b. London. He was intended for trade but entered Queen's College, Oxford, 1773, was ordained 1776–77, ministered at Lewes, Sussex, at St. John's, Bedford Row, and elsewhere in London, from 1780, and held the livings of Cobham and Bisley, Surrey, from 1810. C. was a zealous and eminent preacher, and a leading light of the evangelical party in the English Church. He published *Lives*

of W. E. Cadogan, 1798, of John Bacon 1801, and of John Newton 1808; these, with his sermons, remains, etc., were collected as his *Works* (4 vols. 1811), with a memoir by Josiah Pratt (reprinted 2 vols. 1838). His *Selection of Psalms and Hymns* (1785), though without marked character went through some 40 editions. C. had some talent, or taste, for music, poetry, and painting. He d. at Tunbridge Wells.

CECIL, ROBERT, Earl of SALISBURY: abt. 1550–1612, May 24; son of William C., Lord Burleigh. On the death of his father, having previously held important state offices, he succeeded to what would now be called the premiership. On the accession of James I., C., who had carried on a private correspondence with that monarch before Elizabeth's death, was confirmed in his office, and received many high honors, culminating in that of Earl of Salisbury. In 1608, he was made lord high treasurer, and the exchequer was greatly improved in his hands. C. was a man of immense energy and far-reaching sagacity, undoubtedly the best minister the country had in his time; but he was cold, selfish, and unscrupulous as to the means he took to gain his ends and rid himself of his rivals. His connection with the disgrace of Essex and Raleigh, especially the latter, laid him open to great and deserved odium, in the latter case especially. Like his father, however, he was free from the meanness and dishonesty of enriching himself out of the public money.

CECIL, WILLIAM, Lord BURLEIGH: one of England's greatest statesmen: 1520, Sep. 15—1598, Aug. 15; b. Bourne, Lincolnshire. Educated at the grammar schools of Grantham and Stamford, he thence passed to St. John's College, Cambridge, where he was remarkable alike for diligence and for aptitude in learning. Entering Gray's Inn at the age of 21, he applied himself assiduously to the study of law. History, genealogy, and theology also formed part of his studies at this time; and his knowledge of the last recommended him to the notice of Henry VIII., who presented him with the reversion of the *custos brevium*, an office of value in the common pleas. An alliance with the daughter of Sir Anthony Cook procured him the friendship of the protector Somerset, who, 1547, appointed him master of requests; and in the following year his great abilities procured for him the office of sec. of state. He shared in the disgrace of Somerset, even to imprisonment for three months; but in less than two years after his release, his pre-eminent capacity and fitness secured for him a reappointment to the state secretaryship by the Duke of Northumberland, his former patron's sworn enemy. During his second secretaryship C. effected most important and beneficial changes in the commercial policy of the country. With a sagacity far beyond the spirit of his age he endeavored to throw trade open, and did succeed in abolishing some monopolies; but others proved too strong for him, standing as he did alone at a time when exclusive privileges were considered the only sureties of a profitable trade. When Queen Mary ascended the throne,

CECILIA.

C., being a Protestant, resigned his official employment, because he could not conscientiously serve a Rom. Cath. court; but as a private gentleman he maintained good relations with the Rom. Cath. party, and was one of the few eminent Protestants who escaped in purse and person during that short but infamous reign. His freedom from persecution has given rise to the charge that he was a 'trimmer'—a wholly unjust accusation. C. was naturally cautious and politic, and averse to extremes in religion; but though he took no part in bitter sectarian discussions, he never belied his conscience, and to him is mainly owing the rejection of the bill which the Rom. Catholics had introduced into parliament, with the view to a wholesale confiscation of the estates of Protestants. Prior to Mary's death, C., foreseeing her end, had entered into correspondence with Elizabeth, who, on her accession to the throne (1558, Nov. 16), at once recognizing C.'s capacity for government, appointed him sec. of state. A biography of C. from this time until his death would be a 40 years' history of England, for he was alike the originator and director of that policy which, hitherto, has made Elizabeth's reign memorable above that of any other English sovereign; for although Elizabeth occasionally, in her caprice, favored other courtiers, C. was the statesman whose judgment she relied on in all matters of consequence. His policy at home and abroad, though shrewd and cautious, was also liberal and comprehensive, while he displayed a power of decision, ready and stern, when necessity demanded. As a statesman C. was above animosities and favoritism; his enemies never suffered, and his friends profited nothing by his power. Capacity, truth, and honor were what he sought in public men. Had he been less just history might have been more generous to his memory. The queen created him Baron Burleigh, 1571, and conferred on him the order of the Garter in the succeeding year, when he was also made lord high treasurer, which office he held until his death.

CECILIA, *se-sil'i-â*, SAINT: patroness of music: said to have suffered martyrdom in 230. Her heathen parents, who are said to have belonged to a noble Roman family, betrothed their daughter, who had been converted to Christianity, to a heathen youth named Valerian. This youth and his brother Tiberius became Christian converts, and suffered martyrdom. C., when commanded to sacrifice to idols, firmly refused, and was condemned to death. Her persecutors, it is said, first threw her into a boiling bath, but on the following day they found her unhurt. The executioner next attempted to cut off her head, but found it impossible; however, three days later, she died. As early as the 5th c. there is mention of a church dedicated to her at Rome, and in 821, by order of pope Paschal, her bones were deposited there. St. C. is regarded as the inventor of the organ, and in the Rom. Cath. Church her festival-day, Nov. 22, is celebrated with splendid music. Chaucer, Dryden, and Pope have celebrated St. C., and the painters Raphael, Domenichino, Dolce, and others have represented her in fine pictures.

CECITY—CECUTIENCY.

Another St. C. was born in Africa, and suffered martyrdom by starvation under Diocletian. Her festival is on Feb. 11.

CECITY, n. *sě'sě-tĩ* [F. *cécité*—from L. *cæcītūtem*, blindness—from L. *cæcus*, blind]: blindness.

CECROPIA, *se-krō'pĩ-a*: genus of trees of the nat. ord. *Artocarpaceæ*. *C. peltata*, native of the W. Indies and of S. America, sometimes called trumpet-wood and snake-wood, is remarkable for its hollow stem and branches, exhibiting merely membranous partitions at the nodes. The small branches, these partitions being removed, are made into wind-instruments. The wood is very light, readily takes fire by friction against a harder piece of wood, and is much used by the Indians for procuring fire in this way. The fruit is agreeable and resembles a raspberry. Both the trunk and branches yield a large quantity of saline matter, employed by the French planters in the purification of sugar. The bark is strong and fibrous, and is used for cordage. It is also astringent, and is applied in diarrhea and other diseases.

CECROPIA, *sě-krō'pĩ-a* (*Platysamia Cecropia*): lepidopterous insect of the family *Bombycidae*; the largest moth known in America, and nearly related to the silkworm. It appears in June, is of a dusky gray color, varied with white and black; and sometimes measures $6\frac{1}{2}$ in. across. Its larva is over 3 in. long, with red and yellow warts bearing bristles. The cocoon is of strong and abundant silk which cannot be reeled, but has been corded and spun; it would be an important article of commerce but for the delicate character of the larvæ, which are not easily raised. Those of the *Telea polyphemus* are more hardy. An allied species is the ailanthus silkworm of China.

CECROPS, first king of Attica: in Greek mythology, an autochthon (q.v.), half-man and half-dragon. Belonging to the prehistoric ages of Greece, his real character can only be guessed at. Tradition declared him to be the founder of marriage, the author of the political division of Attica into twelve states, and the introducer of agriculture, of navigation, and commerce. He is said also to have civilized the religious rites of the people. The name C. is given to various towns in Greece, and the legends in general indicate a Pelasgic origin for the hero. The latter accounts, that he came from Sais in Egypt, have no historic basis.

CECUTIENCY, *sě kũ'shen-sĩ* [L. *cæcutiens*, p. pr. of *cæcutio*, I am blind, *cæcus*, blind]: a partial blindness; tendency to blindness.

CEDAR.

CEDAR, n. *sē'dēr* [F. *cédre*—from L. *cēdrus*; Gr. *kēdros*]: a large evergreen tree; the common name of various trees, but especially the *Cēdrus Libānī*, cedar of Lebanon, ord. *Conifēre*. CE'DARED, a. -*dērd*. CEDAR-LIKE, a. CE'DRINE, a. -*drīn*, pertaining to the cedar. CEDAR-BIRD, a common N. Amer. bird like the Bohemian waxwing, so named from frequenting cedar-trees: see WAXWING.

CEDAR, *sē'dēr*, or CEDAR OF LEB'ANON: tree celebrated from the most ancient times for its beauty, magnificence, and longevity, as well as for the excellence and durability of its timber. It is often mentioned in Scripture; it supplied the wood-work of Solomon's temple; and in the poetry of the Old Testament it is a frequent emblem of prosperity, strength, and stability. It belongs to the nat. ord. *Coniferae*, and is the *Pinus cedrus* of the older botanists, but is now ranked in the genus *Abies* (see FIR), in the genus *Larix* (see LARCH) by those who make *Larix* a distinct genus from *Abies*, or is made the type of a genus, *Cedrus*, distinguished from *Larix* by evergreen leaves and carpels separating from the axis, and receives the name of *C. Libani*.

Of the celebrated CEDARS OF LEBANON, only a few remain. They consist of a grove of some 400 trees, about



Cedars of Lebanon.

three-quarters of a mile in circumference, partly old trees, partly young ones. Learned travellers think that most of the trees in the grove may be 200 years old, and several between the ages of 400 and 800 years. There are 12 trees whose age is incalculable—seven standing very near each other; three more a little further on, nearly in a line with them; and two, not observed by any recent traveller except Lord Lindsay, on the n. edge of the grove. The largest of these two is 63 ft. in circumference—following the sinuosities of the bark; one of the others measures 49 ft.

These trees are more remarkable for girth than stature, their height hardly exceeding 50 ft. Their age is variously estimated; the rules by which botanists determine the age of trees are not applicable to them, for their stems have ceased to grow in regular concentric rings; they owe their prolonged existence to the superior validity of a portion of their bark, which has survived the decay of the rest. Russeger is in-

CEDAR CREEK—CEDAR RIVER.

Havana cigar-boxes are generally made of it. In France, it is used in making black-lead pencils.

CEDAR CREEK, BATTLE OF: in the war of secession 1864, Oct. 19, at daylight, during Gen. Sheridan's absence, his army was surprised on this creek, at Alacken, Shenandoah co., Va., by the Confederates under Early, who turned the left flank, and took the camps of the 8th and 19th corps, with 20 guns and some prisoners. Gen. Wright, in command of the Federals, retreated and reformed their line. Gen. Sheridan, arriving 10 A.M., after a famous 'ride,' celebrated in T. B. Read's poem, repelled an assault at 1 P.M., and attacked 3 P.M., routing the Confederates, retaking what had been lost, and capturing some 30 guns, and 2,000 prisoners. The cavalry pursued next day, and in the night Early retreated, leaving the Shenandoah valley open.

CEDAR FALLS: city of Black Hawk co., Iowa, on the Cedar river, at the junction of the Illinois Central and the Burlington Cedar Rapids and Northern railroads. It has eight churches, two newspapers, four banks, and several mills and factories. Pop. (1870) 3,070; (1880) 3,020; (1890) 3,459; (1900) 5,319.

CEDAR MOUNTAIN, BATTLE OF: in the war of secession. 1862, Aug. 9, Gen. Banks was defeated near this hill in Culpeper co., Va., by a superior Confederate force under Gen. Jackson, and retired for reinforcements from Gen. Pope, with a loss of 1,400 killed and wounded, 400 prisoners, and many missing. The Confederates, who held the field two days and then fell back to meet Lee at Gordonsville, lost 1,314.

CEDAR MOUNTAINS: range of the Cape Colony, parallel with the Atlantic, and nearly half way between it and the dividing ridge of the country. They form the height of land between the Oliphant river on the w., and the Great Thorn, its principal tributary, on the e., varying in height from 1,600 to 5,000 ft. They lie about lat. 32° s., and long. 19° e., in the division of Clanwilliam, and supply the village of that name with cedar planks.

CEDAR RAPIDS: city of Linn. co., Iowa, on the Cedar river, 219 m. w. of Chicago, by the Chicago and Northwestern R. R., and 265 m. s.s.e. of St. Paul by the Burlington, Cedar Rapids and Northern R. R., which has its shops here. It is the terminus of the Dubuque and Southwestern R. R. Here are the headquarters of the Iowa railroad land co. It has a good water power, sundry mills and manufactories, several pork-packing establishments, and a large and growing trade, being the centre of supply to an extensive farming region. There are several newspapers, many churches, and a number of fine public and private buildings. A considerable Bohemian colony is settled here and in the neighborhood. C. R. is rapidly increasing in wealth and importance. Pop. (1870) 5,940; (1880) 10,104; (1890) 18,020; (1900) 26,656.

CEDAR, or RED CEDAR, RIVER: rises in Dodge co.,

CEDE—CEIL.

Minn., flows s.s.e. through Mower co., Minn., and eight counties of eastern Iowa, and enters the Iowa river at Columbus, some 30 m. from its junction with the Mississippi; length abt. 350 m.; Charles City, Waverly, Waterloo, Vinton, Cedar Rapids, and other towns are on its banks, which abound in devonian and magnesian limestone. It is navigable only for short distances by small steamers, being dammed at nearly every town. Its waters are well supplied with bass.

CEDE, v. *sēd* [F. *céder*—from L. *cedēre*, to give up: It. *cedere*]: to give up; to yield; to relinquish or surrender to. CE'DING, imp. CE'DED, pp. CESSION, n. *sēsh'ūn* [F. *cession*, a yielding up—from L. *cessiōnem*—from L. *cessus*, given up]: the act of yielding up or granting. CESSIBLE, a. *sēs'i-bl*, liable to give way; yielding. CES'SIBIL'ITY, n. *-bīl'ī-tī*, quality of giving way.

CEDILLA, n. *sē-dīl'lá* [Sp. *cedilla* for *zedilla*: F. *cédille*]: a mark put under the letter *c* (thus *ç*), coming before the vowels *a*, *o*, and *u*, chiefly in F. and Sp. words, to show that it must be sounded like an *s*.

CE'DRATE: see CITRON.

CEDRELACEÆ, *sē-dre-lā'cē-ē*: nat. ord. of exogenous plants, very nearly allied to *Meliaceæ* (q.v.), and distinguished chiefly by the winged seeds, numerous in each cell of the fruit, which is a capsule. The known species are few, all tropical or sub-tropical trees or shrubs, with pinnate leaves, most of them trees valuable for their timber. To this order belong mahogany, satin-wood, toon, Barbadoes cedar, the yellow-wood of New South Wales, etc. The barks of some species are febrifugal. That of *Soymida febrifuga*, the Rohuna or E. Indian mahogany, has been exported as a medicine.

CEDRON, *sē-dron*: medicinal extract from the seeds of *simaba c.*, a tree of the order *Simarubaceæ*, found in Central America and Colombia, where C. is used to cure the bite of serpents and to prevent hydrophobia. Applied either externally or internally, it acts as a bitter principle, and is claimed to possess antiperiodic virtues.

CEFALU, *chā-fā-ló*: town of Sicily, on the n. coast, 47 m. e.s.e. of Palermo. It is at the foot of a promontory, which overlooks the beautiful bay of C., and it is surrounded by old walls. It has a cathedral, begun 1132, with a fine façade; and the ruins of a Saracenic castle occupy a neighboring hill. As a seaport, it has little traffic. The inhabitants are engaged chiefly in fishing. Pop. abt. 14,000.

CEGLIE, *chāl'yā*: town in s. Italy, province of Lecce, 18 m. n.e. of Taranto. It has a trade in grain, oil, and fruit. Pop. about 14,000.

CEHEGIN, *thū-ā-chen'*: town of Spain, province of Murcia, 37 m. w.n.w. of the city of Murcia. It has some spacious streets with handsome buildings, and manufactures of paper, cloth, and pottery. Pop. about 10,000.

CEIL, v. *sēl* [It. *cielo*; F. *ciel*. heaven, sky—from mid. L.

CEILING—CELANDINE.

celum, heaven, sky, then applied to a canopy, the inner roof of a room; afterward confounded with *seal*, in the sense of *to close*]: to cover the inner roof of a building with anything, as with plaster or wood. CEILING, imp.: N. the roof of a room; in *OE.*, a canopy and side hangings of a bed. CEILED, pp. *sēld*.

CEILING. inner roof of a room; a term probably suggested by the use of arched coverings for churches, and even for rooms, which prevailed in the middle ages, and was not unknown to the Romans. Whether the term was further suggested by the habit of tinting ceilings of a blue color, and decorating them with stars, or whether that usage arose from the use of the term already introduced, is more doubtful. Arched ceilings among the Romans were known by the name *cameræ* or *camera*, the Greek origin of which seems to furnish an argument in favor of the view that the arch was known to the latter people. The camera was formed by semicircular beams of wood, at small distances from each other, over which was placed a coating of lath and plaster. In later times, the *cameræ* were frequently lined with plates of glass, whence they were termed *vitreæ*. But the ceilings most common among the Romans were flat, the beams, as in modern times, having been at first visible, and afterward covered with planks and plaster. Sometimes hollow spaces were left between the planks, which were frequently covered with gold and ivory, or paintings. The oldest flat C. in existence is believed to be that of Peterborough cathedral. Like that at St. Albans Abbey, it is made of wood, and plastered over like a modern ceiling. Ceilings of churches, in the middle ages, were generally painted and gilded in the most brilliant manner; and many existing ceilings still show traces of early decoration of this kind. The older ceilings generally follow the line of the timbers of the roof, which, in the Early English and Decorated, are often arranged to give the shape of a barrel vault. In ceilings of this description there are seldom many ribs, often only a single one along the top. In the perpendicular style, the C. often consists of a series of flat surfaces or cants, formed on the timbers of the roof. Though sometimes altogether destitute of ornament, they are more frequently enriched with ribs, dividing them into square panels, with bosses (q.v.) or flowers at the intersections. Wooden ceilings are sometimes formed in imitation of stone-groining, with ribs and bosses, examples of which are at York, Winchester, and Lincoln. In the Elizabethan age, ceilings were generally of plaster, but they were ornamented with ribs having bosses or small pendants at the intersections. It is not unusual for the C. immediately over the altar, or the roodloft in a church, to be richly ornamented, while the rest is plain.

CELANDINE, n. *sĕl'ăn-dĭn* [OF. *celidoine*; Gr. *chelido'nĭōn*; L. *chelido'nĭă*—from Gr. *chelidōn*, the swallow], (*Chelidonium*): genus of plants of the nat. ord. *Papaveraceæ* (the poppy family), having a corolla of four petals, and a pod-like capsule. The common C. (*C. majus*) is a perennial,

CELANO—CELEBES.

with pinnate leaves, lobed leaflets, and yellow flowers in simple umbles, frequent under hedges, in waste places, etc. It flowers from May to Sep. The root, stem, and leaves, when fresh, have a disagreeable smell, and are full of a yellow juice, which is very acrid, causing inflammation



Common Celandine.

when applied to the skin. *C.* is sometimes used in medicine; it is a drastic purgative, and in large doses an active poison; in small doses it is said to act beneficially on the lymphatic system and on the organs of secretion, and to be useful in scrofulous diseases, disease of the mesenteric glands, etc. The fresh juice, applied externally to warts, corns, etc., removes them by stimulating them beyond what their languid vital powers can bear. Mixed with milk it is applied to the eye for the cure of opacities of the cornea, but is a remedy that requires great caution in its use.

CELA'NO, LAKE OF: see FUCINO, LAKE OF.

CELASTRA'CEÆ: see SPINDLE-TREE.

CELEBES, *sēl'e-biz*: large island in the Eastern archipelago, e. of Borneo, between $5^{\circ} 45'$ s. lat.— $1^{\circ} 45'$ n. lat., and 118° — 126° e. long.; 45,150 sq. m. It is irregular in shape, and four peninsulas springing from a common root form the large bays of Gorontalo and Tolo, and the gulf of Boni. *C.* is covered with mountains and valleys; a chain running throughout it sends spurs into the peninsulas. Some are active volcanoes, and earthquakes are frequent. The peak of Bonthaim is 9,788 ft. high. The island has a rich soil and extensive pastures. The vegeta-

CELEBRATE—CELERITY.

ble kingdom gives sago, cocoa-nuts, bread-fruit, coffee, tamarinds, bananas, oranges, pine-apples, maize, rice, tobacco, sugar-cane, indigo, sandal-wood, sapan-wood, and ebony-wood. The animals include excellent horses, buffalo, cattle, wild swine, elands, goats, sheep, parrots, lories, birds of paradise, beautiful butterflies, wild bees, etc. The minerals are gold, iron, coal, and salt. The people spin and weave cottons. Pop., of various races, reckoned at about 396,868, of whom about 7,000 are Chinese and 2,000 are Europeans.—The chief town is Macassar, which gives name to the strait between C. and Borneo. In 1874, Nov., a fire destroyed 774 houses of the town.

CELEBRATE, v. *sěl'ě-brāt* [L. *celebrātus*, visited in numbers, celebrated—from *cēlēber*, much resorted to: It. *celebrato*—*litt.*, to cause to enter largely into the talk of men]: to praise or extol; to render famous; to keep holy; to honor by marks of joy or by ceremonies. **CEL'EBRATING**, imp. **CEL'EBRATED**, pp.: **ADJ.** famous; renowned. **CEL'EBRATOR**, n. one who. **CEL'EBRANT**, one who performs a religious act in a church publicly; the officiating priest in the Eucharist. **CEL'EBRATION**, n. *-brā'shūn*, the performance of solemn rites; the distinguishing by marks of joy or respect; praise; renown. **CELEBRITY**, n. *sě-lěb'ři-tř* [F. *célébrité*—from *célèbre*, celebrated, famous—from L. *cēlēbrem*, much frequented, famous]: fame; renown; distinction or notoriety; a distinguished or famous person. **CELEB'RITIES**, n. plu. *-ři-třz*, distinguished or famous persons.—**SYN.** of 'celebrate': to commemorate; distinguish; honor; solemnize;—of 'celebrated': distinguished; famous; renowned; illustrious.

CÉLÈBRE, a. *sā-lěb'r* [F.]: celebrated; famous. **CAUSE CÉLÈBRE**, *kōz sā-lěb'r* [F. *cause*, a cause]: a famous cause; a remarkable trial in a court of justice.

CELERES, *sěl'er-ěz*: according to Roman antiquity a body of 300 young men selected from the most illustrious families to form a permanent body-guard for the reigning king. This aristocratic guard is said to have been established by Romulus and used by him both in war and peace. The etymology of C. is variously given. Some writers derive it from their first leader, Celer, who is said to have slain Remus, but the majority are inclined to associate it with the Greek *Keles*, in reference to the quickness of their service. The C., who were sumptuously mounted, were under the command of the *Tribunus celerum*, who stood in the same relation to the king as the *Magister equitum* did in a subsequent period to the dictator. He occupied the second place in the state, and in the absence of the king had the right to convoke the comitia. Candidates for the C. had to be approved by the suffrages of the curiæ of the people, each of which furnished ten.

CELERITY, n. *sě-lěř'i-tř* [F. *célérité*—from L. *celeritātem*, swiftness—from *celer*, swift: It. *celerità*, quickness]: swiftness; speed in anything, as actions, thoughts, or of bodies on or near the earth;—*velocity* is more frequently applied to objects remote or inappreciable, as the planets, sound, light,

CELERY—CELESTIAL.

etc. *Note*.—Speaking generally, *velocity* is mere rate of motion, *celerity* is despatch or quickness in doing anything; a railway train may go at a high *velocity*, a man may eat his dinner with great *celerity*.

CELERY, n. *sěl'ér-ĭ* [F. *céleri*—from It. *seleri*], (*Apium*): genus of plants of the nat. ord. *Umbelliferae*, distinguished by a mere rudimentary calyx, roundish entire petals, very short styles, and roundish fruit. The common C. (*A. graveolens*) is found wild in most parts of Europe and in America, in ditches, brooks, etc., especially near the sea and in saline soils. Its leaves are dark green and smooth, its petals involute at the tip. The wild plant, called also SMALLAGE, has a stem about two ft. high, a tapering slender root, a penetrating, offensive odor, a bitterish, acrid taste, and almost poisonous qualities. By cultivation it is so much changed that its taste becomes agreeably sweetish and aromatic, while either the leaf-stalks much increase in thickness, or the root swells in a turnip-like manner. These parts, blanched, are much used as a salad or to impart flavor to soups, etc., and sometimes as a boiled vegetable. They contain sugar, mucilage, starch, and a substance resembling manna sugar, which acts as a stimulant, particularly on the urino-genital organs, so that a very free and frequent indulgence in the use of C. cannot, in ordinary circumstances, be altogether favorable to health. Two principal varieties of C. are cultivated, that most common in Britain having long, thick leaf-stalks, which are more or less tubular, sometimes almost solid, and, after blanching, either white or more or less tinged with red; while the other, called TURNIP-ROOTED C. or CELERIAC, is chiefly remarkable for its swollen, turnip-like root, and is in most general cultivation on the continent of Europe; its root is the part eaten and not the blanched stalks as in C. The 'red' varieties of C. are esteemed rather more hardy than the 'white.' The blanching of the leaf-stalks is accomplished generally by drawing up earth to the plants, which are transplanted from the seed-bed into richly-manured trenches; and as they grow the trenches are filled up and the earth finally raised into ridges, above which little more than the tops of the leaves appear. C. is thus obtained for use throughout the winter. C. seed is often used for flavoring when the leaf-stalks cannot be obtained.—Another species of C. (*Apium australe*) grows abundantly in wet places on the shore about Cape Horn and in the neighboring Staten Island. It is a large, hardy, and luxuriant plant, described as wholesome and very palatable, nearly equal in its wild state to our garden-celery. It seems well worthy the attention of horticulturists.

CELESTIAL, a. *sě-lěst'yăl* [OF. *célestiel*; F. *céleste*, heavenly—from L. *cœles'tis*, heavenly—from L. *cælum*, heaven; connected with Gr. *koilos*, hollow: It. *celeste*]: heavenly; of or pertaining to heaven; belonging to the visible sky: N. an inhabitant of heaven. CELES'TIALLY, ad. -lĭ. CELES'TIALIZE, v. -yăl-ĭz, to make fit for heaven. CELES'TIALI'ZING, imp. CELES'TIALIZED, pp. -ĭzd. CELES-TINE, n. *sě-lěs'tĭn*, a mineral, bearing the same relation to

CELESTINES—CELIAC.

strontia (q.v.) that heavy spar bears to baryta. It is essentially sulphate of strontia (StOSO_3), with occasional admixture of sulphate of baryta, carbonate of lime, oxide of iron, etc., in small proportions. It much resembles heavy spar, but is not quite equal to it in specific gravity; is usually blue, and is named from its color; often of a very beautiful indigo blue; sometimes colorless, more rarely reddish or yellowish. Its crystallization is rhombic, like that of heavy spar. Most beautiful specimens of crystallized celestine are found in Sicily. It is used as a source of strontia. CELESTIAL EMPIRE, China, popularly so named from the claim of its emperor to be the son of Heaven.

CELESTINES, or CELESTINS, n. plu. *sěl'ēs-tinz*: in the Rom. Cath. Church, religious order of hermits of St. Damianus, founded by Peter de Morrone about 1264 and confirmed as a monkish order by Urban IV. 1264 and '74. They called themselves C. when their founder ascended the papal chair under the name of Celestine V. They are regarded as a branch of the great order of St. Bènedict, whose rule they follow; they wear a white garment with black hood and scapulary, and live a purely contemplative life. In the 13th and 14th c. the order rapidly spread through France, Italy, and Germany, but subsequently decayed. The French C. were secularized by order of Pope Pius VI., 1776-78; so also were the Neapolitan Celestines. In the present day the order is almost extinct.

CELIAC, or CÆLIAC, a. *sē'lĭ-ak* [Gr. *koilia*, the belly]: pertaining to the intestinal canal. CELIAC PASSION, a flux or diarrhea of undigested food.

CELIBACY.

CELIBACY, n. *sěl'ĩ-bă-sĩ* [F. *célibat*, celibate, celibacy—from L. *cælibātus*, celibacy—from L. *cælebs*, unmarried, single]: a single life; an unmarried condition. CELIBATE, n. *sěl'ĩ-băt*, the state of being unmarried; one who.—Notwithstanding the divine commendation of marriage given in the Jewish Scriptures (Gen. i. 28), the opinion had become prevalent, even before the time of Christ, that C. was favorable to an intimate union with God. This notion took its origin in the wide-spread philosophy of a good and an evil principle. The body, consisting of matter, the seat of evil, was looked upon as the prison of the pure soul, which was thought to be defiled by bodily enjoyments. Among the Jewish sect of the Essenes, accordingly, a life of C. was held to be the chief road to sanctity. These ascetic views naturally led, in the first place, to the disapproval of second marriages. While, therefore, in the early Christian churches, every one was left at liberty to marry or not as he thought fit, the objection to those who married a second time soon became generally spread.

By the 2d c., however, the unmarried life generally had begun to be extolled, and to be held necessary for a life of sanctity, though several, at least, of the apostles themselves had been married. Two passages of Scripture (1 Cor. vii. and Rev. xiv. 4) were specially cited as proving that C. was the genuine condition of a Christian; and with the platonizing fathers of the 2d and 3d c., the unmarried of both sexes were held as standing higher than the married. Accordingly, though there was no express law against the marriage of the clergy, many, especially of the bishops, remained unmarried; a second marriage was, in their case, already strictly prohibited.

As the bishops of Rome rose in consideration, and gradually developed a firmer church government, they called upon all who belonged to the clerical order to live for the church alone, and not marry. This requirement met with constant resistance; still, it became more and more the custom, in the 4th c., for the higher clergy to refrain from marriage, and from them it went over to the lower orders and to the monks. Provincial synods now began expressly to interdict the clergy from marrying. The council of Tours (566) suspended for a year all secular priests and deacons who were found with their wives; and the emperor Justinian by an edict declared all children born to a clergyman after ordination, to be illegitimate, and incapable of inheritance. There were still, however, many married priests who resisted the law; and found encouragement in the opposition which the Greek Church made to that of Rome on the question of celibacy. The council at Constantinople 692, declared, in opposition to the Church of Rome, that priests and deacons might live with their wives as the laity do, according to the ancient custom and ordinance of the apostles. The orthodox Greek Church has adhered to this decision. Priests and deacons in that church may marry before ordination, and live in marriage after it, though they are not allowed to marry a second

time. However, only a priest living in C. can be chosen as bishop or patriarch.

The Church of Rome continued its endeavors to enforce the law of C.; though, for several centuries, with only partial success. There still continued to be numbers of priests with wives, though the councils were always issuing new orders against them. Popes Leo IX. (1048-54) and Nicolas II. (1058-61) interdicted all priests that had wives or concubines from the exercise of any spiritual function, on pain of excommunication. Alexander II. (1061-73) decreed excommunication against all who should attend a mass celebrated by a priest having a wife or concubine. This decision was renewed by Gregory VII. in a council at Rome 1074, and a decretal was issued that every layman who should receive the communion from the hands of a married priest should be excommunicated, and that every priest who married or lived in concubinage, should be deposed. The decree met with the most violent opposition in all countries; but Gregory succeeded in carrying it out with the greatest rigor; and though individual instances of married priests were still found in the 12th and 13th c., the C. of the Rom. Cath. clergy was established, and has since continued both in theory and in practice.

The violence thus done to human nature did not fail to avenge itself in those rude times. The licentiousness and corruption of the priests and monks became in many cases boundless, and it was in vain that strict individuals, as well as councils, strove against it. The immorality and debasement of the clergy became a reproach and by-word in the mouth of the people, and gave a powerful impulse to the religious reform that began in the 16th c. The leading reformers declared against the C. of the clergy as unfounded in Scripture, and contrary to the natural ordinance of God, and Luther set the example of marrying. This was not without effect on the Rom. Cath. clergy, and the question of the abolition of C. was raised at the council of Trent (1563). But the majority of voices decided that God would not withhold the gift of chastity from those that rightly prayed for it, and the rule of C. was thus finally and forever imposed on the ministers of the Rom. Cath. Church. Those who have received only the lower kinds of consecration may marry on resigning their office. For all grades above a subdeacon, a papal dispensation is necessary. A priest that marries incurs excommunication, and is incapable of any spiritual function. If a married man wishes to become a priest he receives consecration only on condition that he separate from his wife, and that she of her free will consent to the separation and enter a religious order, or take the vow of chastity. The priests of the united Græco-Catholic congregations in Rome have received permission from the popes to continue in marriage, if entered into before consecration, but on condition of always living apart from their wives three days before they celebrate mass.

Notwithstanding these decisions, the contest against

CELL—CELLINI.

clerical C. has again and again been resumed, in recent times, both within and without the Rom. Cath. Church. In fact, all attempts at innovation within the bosom of Catholicism, connect themselves with the attack on C., the abolition of which would deeply affect the constitution and position of that church. Between 1817 and 1848 the propriety of putting an end to compulsory C. had been discussed publicly in most European countries, either by clergy, legislatures, or the press. The German Catholics (q.v.) abolished C. In Austria, the state took the side of the pope, who, in a bull of 1847, had added fresh stringency to the rule of C. The permission of marriage to the clergy was one of the principal contentions of the Old Catholics in Germany 1874, and is maintained by the Separatist Church. Père Hyacinthe in France vigorously upheld the demand for legitimating clerical marriages. (See BACHELOR.)

CELL, n. *sěl* [L. *cella*, a hiding-place: F. *cellier*, a cellar: It. *cella*, a cell, a cellar: Gael. *ceil*, a cell—*lit.*, a hut or quarters for slaves]: a small, confined room; an apartment in a prison; a small cavity, as of a honey-comb; a private room in a nunnery or monastery; one of the vesicles of protoplasm out of which the bodies of plants and animals are primarily built up. CELLED, a. *sěld*, furnished with cells. CELLA, n. *sěl'lä*, the body or principal part of a temple. CELLAR, n. *sěl'lér* [F. *cellier*—from mid. L. *cellārĭum*, a storeroom for wine and provisions]: a storehouse for wine, oil, and provisions; a room or place under a house used for storing coals, etc. CEL'LARAGE, n. *-āj*, the capacity of a cellar or cellars; range or system of cellars; charge for cellar-room. CEL'LARET, n. *sěl'lä-rět'*, an ornamental case for bottles. CELLARER, purveyor or steward, in charge of provisions, and keeping the accounts, of a household; especially under the Roman emperors, or in a monastery. CEL'LARIST, n. CEL'LARMAN, n. one who has charge of the cellar. CELL-WALL, n. in *physiology*, the external, vesicular membrane, which incloses the germinal substance or protoplasm. VAULTING-CELL, in *arch.*, the hollow space between the principal ribs of a vaulted roof.

CELLE, or ZELL, *tsěl'le* or *tsěl*: town of Prussia, on the Aller, 23 m. n.e. of Hanover in the midst of a sandy plain. The chief manufactures are linen, hosiery, tobacco, wafers, soap, etc. Pop. (1880) 18,800.

CELLINI, *chěl-lē'nē*, BENVENU'TO; 1500-70 (or 72); b. Florence: celebrated Italian gold-worker, sculptor, founder, and medaillieur, remarkable not only for his skill as an artist but also for his checkered life. He showed skill first as a chaser and gold-worker. His autobiography is remarkably curious and interesting, presenting a complete picture of the author's life and character; his activity, his extraordinary weaknesses, the impetuosity of his passions, the perilous circumstances in which his quarrelsome disposition placed him (for C. thought nothing of committing manslaughter in a moment of rage), and the ludicrous vanity and credulity which are never absent from him.

The book is also of great value in a historico-social point of view, but gives no favorable impression of either the personal or the social morals of the time.

At an early period, having been banished from Florence in consequence of an 'affray,' C. went to Rome, where he was employed by many distinguished patrons of art, but afterward was allowed to return to Florence. Another 'affray' compelled him to flee to Rome a second time, where he secured the favor of Clement VII. C., by his own account, was as great in arms as in art; he declares that it was himself who killed the constable Bourbon and the Prince of Orange at the siege of Rome. His reckless conduct for some years compelled his constant shifting between Rome and Florence, Mantua, and Naples. In 1537 he went to the court of France, where he was very honorably received. Illness, however, induced him to return yet once more to Rome, where he had the misfortune to be imprisoned on a charge of plundering the treasures in the castle of St. Angelo during the siege of Rome. At length he was liberated, through the intercession of the Cardinal of Ferrara, for whom he executed, out of gratitude, a fine cup, and various other works. He now accompanied his deliverer to France, and entered the service of Francis I.; but having incurred the displeasure of the ruling favorite, Madame d'Estampes, he returned to Florence—not, however, until, as usual, he had settled some matters with his 'sword'—where under the patronage of Cosmo de' Medici, he executed several fine works in metal and marble—among them the celebrated bronze group of *Perseus with the Head of Medusa*. In his 58th year he began to write his autobiography. In 1876, a number of C.'s original papers were found. See the magnificent monograph of C. by Eugene Plon (1882).

CELL-THEORY.

CELL-THEORY, in Physiology: theory of the cellular composition and origin of the different parts of plants and animals. In the latter half of the 17th c., Malpighi and Leeuwenhoek on the continent, and Hooke and Grew in England, commenced the application of the simple microscope to the examination of the minute structure of plants and animals; but although their labors in this department of biology were continued by Swammerdam and others during the 18th c., the foundation of scientific histology was not laid until the appearance, 1801, of the *Anatomie Générale* of Bichât. In this epoch-making work, the conception of the *tissue theory*, as it may be termed, is first stated, the vital activities of the body being regarded as the sum of the vital activities of its component *tissues*, which are for the first time described. Not only, too, are the tissues defined and described, but they are discussed in detail in their healthful and morbid conditions. In fact, Bichât thus 'founded a system of histology by the aid of the anatomist's knife, of chemical analysis, and of pathological and physiological research, in which investigation without the microscope reached its zenith, but in which the tissue-elements remained in obscurity.'

The invention of achromatic lenses (see **LENS: MICROSCOPE**), and their combination into the compound microscope, enabled anatomists to inquire into the composition of the tissues themselves with ever-increasing success. 'Fibres' and 'globules,' 'laminæ,' 'nuclei,' and even 'cells,' were described; the latter with some distinctness among plants; but the first clear idea of their nature and relations was emitted by Johannes Müller, 1835, who pointed out that the cells of the vertebrate notochord resembled those of plants. The cellular nature of epidermis, and the presence of nuclei therein, were next ascertained, and the like discoveries were made for several other tissues. Robert Brown discovered the nucleus in plant-cells; and, in 1838, Schleiden proved that a nucleated cell is the only original component of a plant embryo, and that the development of all tissues might be referred to such cells. In the following year, Schwann published at Berlin his famous *Microscopic Investigations on the Accordance in the Structure and Growth of Plants and Animals* (transl. Sydenham Soc., 1847), in which the cell-theory was definitely constituted, the accordance asserted in the structure and development of the most different parts of plants and animals alike being their cellular composition and origin.

Schwann defined the cell as consisting of a *membrane*, having more or less fluid *contents*, and a central mass or *nucleus*. Schleiden had supposed the origin of new cells to take place in the interior of pre-existing cells; Schwann, on the contrary, assumed the formation of new cells in an intercellular substance, of which the granules or globules built themselves to form a nucleus, around which subsequent particles became grouped into an enlarging sphere, the structure being completed by the formation of a membrane. Both views, however, were erroneous. Dujardin,

in the course of his microscopic studies of the lowest forms of animal life, had already discovered that their bodies were composed of a viscous, granular, contractile, living substance—his ‘sarcode,’ now better known as ‘protoplasm,’ a term subsequently proposed by Von Mohl, to denote the essentially similar ‘contents’ of the vegetable cell, henceforth no mere inert fluid. The nature and constancy of the membrane in plants and animal cells continued to be hotly debated until 1865, when Max Schultze established a new definition of the cell, as essentially a nucleated mass of protoplasm, with or without an investing membrane. In 1824, Prevost and Dumas had observed that the development of the embryo commenced with the division of the ovum into segments; and, in 1840, Reichert suggested that these segmentation masses were really cells. This was demonstrated by Kölliker, 1846, who showed (1) that in embryos, all the tissues are built up of the descendants of the cells which arise by the cleaving of the yolk; (2) that the multiplication of animal and vegetable cells takes place, usually by process of transverse division identical with segmentation, and resembling, too, that already observed among the Protozoa; (3) that Schwann’s free nuclei or incipient cells nowhere occurred. These observations were confirmed by Remak, 1852, and the study of the embryonic development of tissues (histogenesis) was thus organized.

In 1858 appeared another biological classic—the *Cellular Pathologie* of Virchow—worthy to rank after those of Bichât and Schwann, since it applied their discoveries in the department of structure, to the illumination of physiology and pathology—the study of function, normal and abnormal alike. This contained the conception, that ‘every animal presents itself as a sum of vital unities’—in other words, that the activities of an organism are the sum of the activities of its component cells. The general aim of the work is to give ‘a view of the cellular nature of all vital processes, both physiological and pathological, animal and vegetable, so as distinctly to set forth what even the people have long been dimly conscious of, namely, the unity of life of all organized beings; in opposition to the one-sided humoral and neuristical (solidistic) medical tendencies which have been transmitted from the mythical days of antiquity to our own times, and at the same time to contrast with the equally one-sided interpretations of a grossly mechanical and chemical bias, the more delicate mechanism and chemistry of the cell.’ By copious observation, too, the results of Kölliker and Goodsir (condensed in the aphorism ‘*Omnis cellula e cellula*’) were confirmed and extended to pathology; for ‘every pathological structure has a physiological prototype, and no form of morbid growth arises which cannot in its elements be traced back to some model which had previously maintained an independent existence in the economy.’

The cell-theory being thus founded, histologists were in a position to devote themselves profitably to the study of the structure and development of cell-aggregates, of vegetable and animal tissues and organs.

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VEGETABLE HISTOLOGY.—*The Cell.*—If a film of epidermis, stripped from a young hyacinth or lily leaf, or a thin section of the growing point of a fern, be placed under the microscope, an admirably clear idea can be obtained of the structure of an embryonic or little differentiated vegetable cell—the protoplasm with its nucleus, its granules and sap vacuoles, being easily distinguishable, even without the addition of a dye. In some cells, such as the stinging hairs

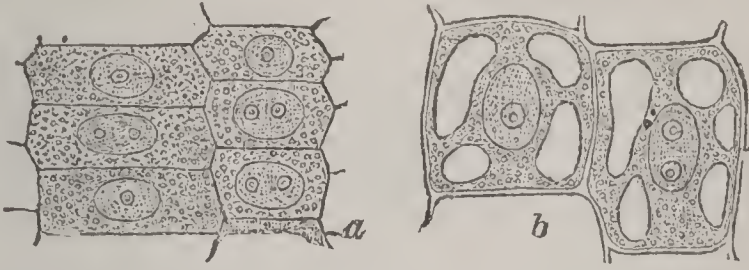


Fig. 1.

a, embryonic cells from growing-point of a root; *b*, older cells becoming vacuolated (after Sachs).

of the nettle, those forming the staminal filaments of *Tradescantia*, or those of certain aquatic plants, such as the common *Anacharis* or *Chara*, the protoplasm may be observed in circulation; a continuous current passing round and round the interior of each cell, with a speed which may be considerably increased or diminished by simply warming or cooling the preparation. As types of unicellular plants, the student may conveniently examine yeast; the *Protococcus*, which abounds in stagnating pools, roof-gutters, etc.; or its ally, which forms the green film on the stems of trees. In *protococcus* the protoplasm owes its green hue to the presence of diffused chlorophyl (q.v.), but in higher plants the chlorophyl is contained in numerous small masses of denser protoplasm, the chlorophyl bodies, from which it may be removed by alcohol and other solvents. The starch which is formed within chlorophyl grains during sunlight (see LEAF) may easily be distinguished. Other cell-contents—oil globules, proteine crystals or crystalloids, albuminoid or aleurone grains, etc.—are frequently present. The cell sap consists of water with various substances in solution—inuline, sugar, tannin, and coloring matters, and salts, of which calcium oxalate most frequently crystallizes out. But in many tissues, not only the protoplasm, but the whole cell contents may wholly disappear, leaving only the cellulose wall, filled with air.

Cell-wall.—The cell-wall is secreted by the protoplasm, but its growth is rarely uniform either in surface or thickness. The mutual pressure of even the most undifferentiated cells of any solid tissue compels them to assume a polyhedral shape, and this is often much more modified—the commonest and extreme change being that of enormous elongation, to form the fibres of which hard bast (see WOOD) and the greater portion of wood are composed. Variations in thickening are also very frequent, leading to the presence of knots or ridges, of pits of many forms and

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even perforations, which are described in most works on botany with a fulness of detail considerably out of proportion to their importance. Thick cell-walls usually exhibit a stratified appearance like that of starch grains, due to the alternation of more or less watery layers. These were at first considered by histologists to indicate the origin of the cell-wall by deposition of successive laminae one within another; but this view was controverted by Nägeli, whose theory of intussusception (i.e., of interposition of new

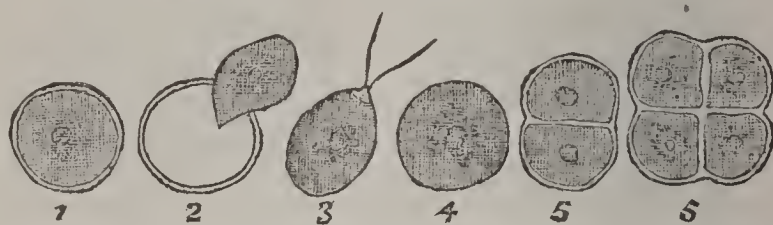


Fig. 2.—Life-history of Unicellular Plant (*Protococcus*):
1, encysted; 2, quitting its wall; 3, ciliated; 4, quiescent; 5 and 6 dividing.

‘micellæ,’ as he terms the crystalline particles, surrounded by water, of which he assumes all organized structures to consist), with subsequent differentiation of the laminae, became generally adopted. The recent very thorough researches of Schimper and Strasburger upon starch grains and cell-walls respectively, have induced them, however, to return to what is substantially the earlier view.

The cell-wall at first consists of pure cellulose (q.v.), in which, however, modifications usually soon occur. Sometimes only a small quantity of mineral salts, the ash of wood, becomes deposited, but more frequently the wall becomes either woody, corky, or gluey. The former change is due to the deposition of the substance known as *lignine* or *xylogen*, to which the hardness, elasticity, permanence and other characteristic physiological and economic properties of wood are due. In cork, which forms the outer layer of the bark under the epidermis of stems and branches, and can conveniently be studied in a transverse section of a potato or of any twig, the *suberine*, with which a considerable quantity of silica, etc., is often associated, makes the cell-wall exceedingly impervious to water and gases; hence its use to the plant depends mainly upon the same properties which make it useful to man. Suberified cell-walls are usually very thin, whence their compressibility. The cork layer also serves as a defense against mechanical injuries, and is a good non-conductor. The thin film or cuticula, which overlies the cells of epidermis is also suberified. The gluey or colloid change is due to a modification of a cell-wall, which renders it capable of absorbing great quantities of water and of swelling up to perhaps a hundred times its former volume, and may even go so far as the production of soluble gum. In cherries, etc., this seems a merely pathological process, but normally takes place in the epidermis of certain seeds, thereby gumming them down to the soil whenever they alight upon a

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damp spots suitable for germination. None of these changes need affect the whole cell-wall, but only certain layers of it; thus the woody change may take place only in the inner or middle laminae of the cell-walls. The gelatinous change occurs most frequently in the middle, while suberine may be deposited on the outer surface of a cell-wall only.

Modes of Union between Cells —Of adjacent cells, the walls are usually continuous, but frequently leave intercellular spaces at their angles. The protoplasm of one cell thus seems completely separated from that of others, and though in many cases of thickened cell-walls, deep pits are present, and correspond to each other on opposite sides, yet a thin septum in the position of the original cell-wall can always be made out, which separates the cell-contents, without preventing osmosis (see OSMOSE). In the cambium cells of rhododendron, in the irritable cushion at the base of the leaf-stalk of the sensitive plant, etc., a direct continuity of the protoplasm from cell to cell, through fine pores in their walls, has recently been described by careful observers, and is supported not only by such analogies as that of the structure of volvox (q.v.), and some protozoa, but also by the fact of the undoubted continuity of the protoplasm in the bast vessels (sieve-tubes).

Vessels.—In addition to cellular, we find also *vascular* tissue, elongated tubes arranged in bundles, in phanerogams, and all cryptogams higher than mosses. In a longitudinal section of the tip of a fern or other stem—say the rhizome of the bracken (*Pteris*)—the cells along certain lines, continuous with the woody portion of the bundle, are to be seen arranging themselves in rows; their protoplasm and their partition walls become absorbed and disappear, and a *cell-fusion*, or vessel, is the result. The walls of vessels become thickened in various ways, and are then termed dotted, scalariform, spiral, annular, etc. In the other portion of the bundle, the bast, certain cells also unite to form vessels, but their protoplasm persists, and becomes continuous from vessel to vessel, through a multitude of minute perforations in their oblique partitions, whence their common name of sieve-tubes.

Tissues.—De Bary considers the permanent tissues of plants under seven heads: (1) *Cell-tissue*, epidermis, cork, parenchyma, etc.; (2) *Sclerenchyma*, hard, thickened cells and fibres; (3) *Gland-cells*; (4) *Tracheal-tissue*, wood-vessels and similarly marked modified cells; (5) *Sieve-tubes*; (6) *Laticiferous tubes*; (7) *Intercellular spaces*.

The enormous variety of cellular and vascular structures to be observed in plants is yet susceptible of another simple classification, according to their position and development. Just as the whole plant is reducible to an axis bearing lateral appendages, so its constituent cell-structures are to be considered as modifications of one or other of three tissues—the epidermic, the fundamental, and the fibro-vascular. The epidermis, besides forming a continuous external layer, may give rise to hairs, stomata, spore-cases, etc.; the fundamental, besides forming ordinary parenchyma, may be

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hardened into sclerenchyma, softened into collenchyma, or the like; while the fibro-vascular bundles, when present, are of considerable complexity. They consist of bast and wood (*phloem* and *xylem*), which may be variously arranged, but each usually contains cells, fibers (prosenchyma), and vessels. Thus in tabular form, the tissues are:

- | | | |
|---|-----------|---|
| I. Epidermic (hairs, spore-cases, etc.). | | |
| II. Fundamental (parenchyma, sclerenchyma). | | |
| III. Fibro-vascular | { 1. Bast | 1. Cells. |
| | | 2. Cells elongated (fibres). |
| | | 3. Cells united in rows (vessels), sieve-tubes. |
| | { 2. Wood | 1. Cells. |
| | | 2. Cells elongated (fibres). |
| | | 3. Cells united in rows (vessels), dotted, spiral, annular, scalariform, etc. |

It is also necessary to recognize the distinction between the formed or permanent tissues and the formative, undifferentiated *meristem* tissues, to which the former owe their origin. Primary meristem can be observed by cutting sections of the growing point of the stems and roots; its cells are rich in protoplasm, contain few vacuoles, are thin-walled, without intercellular spaces, and all are capable of division. In most algæ, in mosses, ferns, and horsetails, a fortunate longitudinal section will reveal the apical cell, by the division of which in certain regular planes the whole meristem has arisen; and such a section of the apex of a vascular cryptogam also shows the meristem in process of differentiation into the adult tissue. Three layers are formed—the *dermatogen*, or primitive epidermis; the *periblem*, from which the cortical tissues arise; and the *plerome*, which develops into the axial tissues and fibro-vascular bundles. In the higher plants, too, the embryo is at first composed wholly of primary meristem, and this usually separates into the same three zones. In gymnosperms and dicotyledons, the ‘cambium layer’ of dividing cells which lies between the wood and bast portion of the fibro-vascular bundle, and to which their circumferential growth is due, as well as the more external similar layer of ‘cork cambium,’ are termed secondary meristem. (See WOOD: LEAF: etc.: also Carpenter *On the Microscope*; Sachs’s *Text-book of Botany*, etc.).

ANIMAL HISTOLOGY.—Just as the resting *Protococcus*



Fig. 3.—Life-history of *Amœba*.

1, encysted; 2, escaping; 3, free; 4, dividing; 5, free half, with vacuole *v*, nucleus *n*, and food particles *f*; 6, encysting anew.

(fig. 2), the encysted *Amœba* (fig. 3), may be taken as the

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type of the vegetable cell; so the free and naked *Amœba* (which is closely similar to the white corpuscles of the blood) or *Protoctoccus* (fig. 2, Nos. 3' and 4') may be regarded as a typical animal cell, both in its structure and functions. Structurally, it is of extreme simplicity (fig. 4); it is Schultze's nucleated mass of protoplasm, with at most a slight differentiation into an outer clear layer, and an inner more granular and fluid substance, containing food particles and sap-vacuoles, one of which may become enlarged and rhythmically contractile for the expulsion of surplus fluid and waste products.

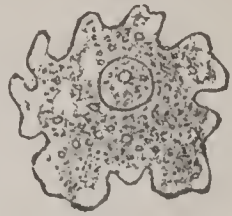


Fig. 4.

Physiologically, however, it is superlatively complex, since its morphologically simple protoplasm exhibits all those vital properties which, in the higher animals, are found almost completely differentiated off to separate tissues. Thus it is contractile, like muscle; it exhibits the irritability and automatism which characterize the nervous tissues; it is receptive and assimilative, like the digestive system; its protoplasm undergoes incessant destructive change, respiratory and other, and the waste products have to be utilized when possible, but in any case got rid of; and thus we have the principle of all respiratory, secretory, and excretory apparatuses. Finally, it is reproductive. In the higher animals (vast colonies of amœbæ which have arisen by repeated transverse division, the ordinary mode of amœboid multiplication, from a parent amœba—the ovum), we find that 'certain groups of the constituent amœbiform units or cells have, in company with a change in structure, been set apart for the manifestation of certain only of the fundamental properties of protoplasm, to the exclusion, or at least to the complete subordination of the other properties.' These groups are the tissues. One set is specialized for contractile purposes, its 'automatism, metabolism, and reproduction being kept in marked abeyance. Of another tissue, the nervous, the marked features are irritability and automatism, with an almost complete absence of contractility and a great restriction of the other qualities. In a third group, the activity of the protoplasm is largely confined to the chemical changes of secretion,' and we have the glandular epithelium of the alimentary system. Similarly the pulmonary and the renal epithelium are specialized for respiration and excretion, and so on. A physiological analysis of the body into its fundamental tissues (Bichât's theorem) is stated by Foster as follows:

1. The eminently contractile; the muscles.
2. The eminently irritable and automatic; the nervous system.
3. The eminently secretory or excretory; digestive, urinary, and pulmonary, etc., epithelium.
4. The eminently metabolic; fat cells, hepatic cells, lymphatic and ductless glands.
5. The eminently reproductive; ovary, testis.
6. The eminently indifferent or mechanical; cartilage, bone, etc.



Celandine (*Chelidonium majus*): *a*, a flower.



Lesser Celandine (*Ranunculus Ficaria*).



Cell.—Dividing Egg-cell.

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These tissues being aggregated and compounded into organs, which have to be nourished and purified by the aid of a circulatory system, and co-ordinated and brought into relation with the outer world by means of a nervous system, the path will be sufficiently evident by which one passes from the study of the *amœba* to the most recondite problems of physiology. (See Foster's *Physiology*, introduction: and separate articles, DIGESTION: RESPIRATION: etc.)

A more strictly histological classification places the animal tissues under four heads: (1) epithelium, the least modified from the embryonic state, including the ordinary epidermis, and its modifications in the organs of special sense, the epithelium of the glandular, secretory, respiratory, and reproductive systems, etc.; (2) connective tissue, characterized by a great development of intercellular substance, and consequent diminished physiological activity of the cells, and including ordinary connective tissue, bone, cartilage, many pathological products, etc.; (3) muscular tissue; and (4) nervous—these two last being the most highly specialized and differentiated, both in structure and function. See MUSCLE: NERVE: BONE: etc.; also Klein's *Atlas of Histology*, and any manual.

Tissues may be classified also according to the primitive layers of undifferentiated cells from which they arise in the embryo, as ectodermic, mesodermic, or endodermic. See DEVELOPMENT: also Balfour's *Embryology*.

GENERAL HISTOLOGY.—The general conception of the cell-theory having been clearly formed, and a scrutiny, aiming at exhaustiveness, of the structure of plants and animals having since been in fruitful progress, we are in a position to inquire whether—and if so, what—unity of result has been obtained, over and above the generalizations just outlined of vegetable and animal histology, respectively. Such results are numerous and important, and require brief notice in order

Cell-multiplication.—The fact of the normal origin of the vast majority of animal and plant tissues, by the transverse

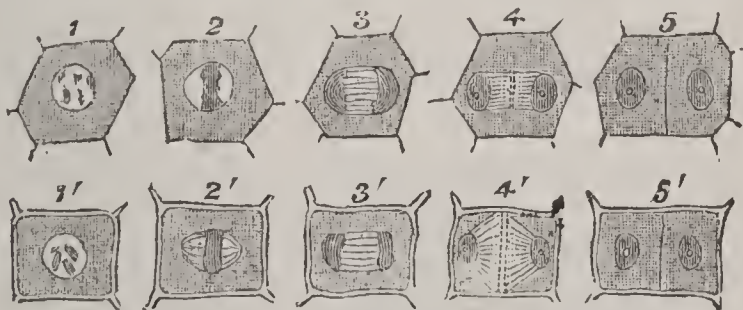


Fig. 5.—Stages of transverse division.

1, 2, 3, 4, 5, in epidermis of a tadpole; 1', 2', 3', 4', 5', in epidermis of lily (after Macfarlane).

division of pre-existing cells (themselves arising ultimately by the division of a parent cell—the ovum), must, after the conception of the cell itself as a unit-mass of protoplasm, always remain the fundamental proof of the unity which underlies the variety of organic structure. Yet, important results have accrued from the recent study of the details of

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the process of division (rendered possible by those improvements of the technical method of fixing and coloring the finest details of structure, upon which advance now so largely depends, the power and definition of the microscope having been long sufficient for ordinary purposes). The division of the nucleus is seen to be a gradual process of great complexity (see fig 5).

Its details cannot here be entered upon; but the fact of a close correspondence—stage for stage—in the mode of division of plant and animal cells, which will be sufficiently evident on inspection of the figure, is what here concerns us.

The process may be readily observed with ordinary microscopic power in developing pollen taken from a bud—say of *Tradescantia*, or in the epidermis of a growing lily leaf, or in the outer skin of the tadpole.

The minor modes of cell-multiplication also demand a share of attention. The process of *free-cell formation*, in which, within a given cell, a number of nuclei appear, around which the protoplasm groups itself into new unit masses (a process which, curiously, includes the main points of both Schleiden's and Schwann's hypotheses of cell-formation, outlined above), may be observed alike in the embryo-sac of a phanerogam, the spore-cases of many fungi, or occasionally in animal tissues. Since the nuclei have frequently been seen to arise by a segmentation of the original nucleus of the parent cell, this process may be regarded as really only a modification of that of transverse division.

Gemmation, the formation of a new cell by the enlargement of an at first minute vesicle or bud, which is protruded at some portion of the periphery of the parent cell, is most conveniently observable in yeast, but is known to occur in others of lower organisms, both plant and animal. It is not improbable that this, too, is preceded by division of the nucleus.

Rejuvenescence.—In many of the lower algæ, fungi, and even protozoa, the protoplasm of a cell may be seen to contract and round itself, with expulsion of water and apparently complete internal rearrangement. It then commonly escapes from its wall, and after a period of activity of variable length, encysts itself and settles down anew. (See figs. 2, 3, and 6.)

Conjugation.—In adjacent parallel filaments of the common fresh water alga *Spirogyra*, the constituent cells may frequently be observed to throw out processes, which unite and bridge the intervening space. Through the tubular connecting bridge the protoplasm of one cell flows into the cavity of the other, and completely unites with it. The united mass becomes rounded off, forms a new cell-wall, and after a period of quiescence undergoes repeated transverse division, so forming a new filament. The like process of conjugation can be observed, not only among many algæ and fungi, but among the protozoa—most easily among the infusorian inhabitants of a drop of stagnant water. The fertilization of the higher animals and plants, in which ovum is fertilized by spermatozoon, or egg-cell by anthero-

zoid, is simply a differentiation of the process of conjugation, the two apparently similar masses of protoplasm having become externally distinguishable by constancy of form and origin. (See DEVELOPMENT.)

Besides the change from the encysted to the naked and motile state, which is the main feature of rejuvenescence, other analogous cell-transformations commonly occur. A monad before encystment loses its long vibratile cilium and its definite form, to melt down into a creeping amœboid mass; and this change from the ciliated to the amœboid state is of great importance among the protozoa (fig. 6). The ciliated zoospore (q.v.) of a sea-weed settles down in the same way; and in such highly organized animals as worms and echinoderms, we find the ciliated cells lining the body cavity falling off, to melt into amœboid corpuscles.

The converse change from the amœboid to the ciliated



Fig. 6—Protomyxa:

1, encysted; 2, dividing; 3, spores escaping—as ciliated bodies, passing into 4, amœboid state; 5, plasmodium.

state is also observable, and it seems not improbable that the three phases which the lower cellular organisms exhibit more or less completely—the encysted, the amœboid, and the motile—were the fundamental forms of the cell; those cell-aggregates which we term the higher plants and animals being made up of more or less differentiated encysted, amœboid, and ciliated cells, variously arranged.

A process, sometimes regarded as of multiple conjugation, is the formation of a *plasmodium*: an indefinite number of amœboid cells flowing together into a single mass. At first described in myxomycete fungi, it was next found to occur in protomyxa, one of the lowest rhizopods (fig. 6) (in both cases preceding encystment and free-cell formation), and it has recently been shown that the amœboid cells of the cor-

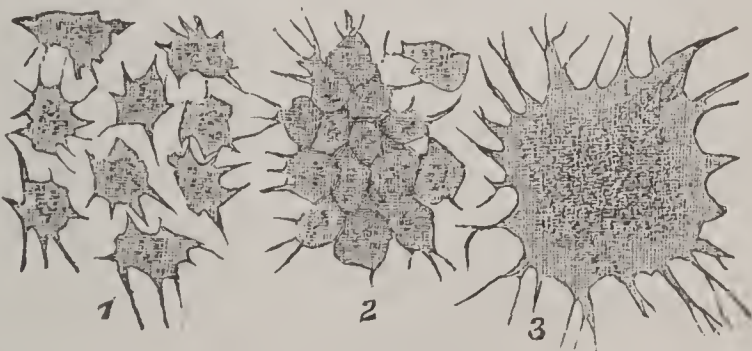


Fig. 7.—Amœboid Corpuscles of Invertebrate, uniting when drawn. pusculate fluids of all invertebrate animals similarly unite when drawn (fig. 7); thus, this also is seen to be a fundamental property of the amœboid cell.

CELLULAR.

Numerous other observations in cell physiology are accumulating. The phenomenon of circulation above mentioned as visible in the protoplasm of many vegetable cells, has been also observed in at least one case in the animal kingdom, where also movements of the nuclei have sometimes been observed. So, too, though the various forms of contractile tissue presented by the animal world do not, of course, find parallels in the plant, the fluid of the contractile vacuole of the rhizopod is as much cell sap as that of the vegetable cell.

Returning to questions of cell structure, some recent students of the process of cell division have also concluded that the so-called granules of the protoplasm of animal cells are really the optical expressions of the thickened intersections of a delicate network of denser filaments—the *stroma*—between the meshes of which lies the more fluid protoplasm; and there is little doubt that a similar structure exists in the vegetable cell, although there the frequently enormous development of sap-vacuolles presses the protoplasm into threads, as in *Spirogyra*, which cannot then be fairly compared to the stroma. There is considerable reason to believe that the fibrils of in any case a plain muscular fibre represent the stroma, in which contractility would thus be mainly localized. But the granules and stroma of vegetable and animal cells alike are possibly mere temporary differentiations, like the 'aggregation of the protoplasm' discovered in plant-cells by Darwin. An intra-nuclear network of fibrils is frequently described, though whether this be or be not continuous with the stroma through the nuclear membrane, is disputed. Within the nucleus, a smaller central body, the nucleolus, can be discerned, and within this very frequently yet another, the endo-nucleolus; and the process of division has been described as originating in the innermost of these, and passing successively outward to the protoplasm.

A large number of the lower plants and animals were supposed to be non-nucleated, but more careful study has led to the discovery of nuclei in all, save only a few of the lowest rhizopods and the bacteria. Multinucleate cells are of very frequent occurrence, especially among plants. Although the appearance of nuclei, *de novo*, in new cells formed by gemmation has been described, the balance of evidence is vastly in favor of the invariable origin of nuclei from pre-existing nuclei. We have seen, too, that the wall of the plant-cell corresponds structurally and chemically with the cyst of the protozoon, and thus, though new evidence is incessantly forthcoming, hardly any further evidence can be desired to justify the fundamental idea of the cell-theory and of Schwann's immortal work, *The Accordance in the Structure and Growth of Plants and Animals*.

See Strassburger's *Zellbildung u. Zelltheilung*; also articles on Anatomy, Histology, and Morphology of *Encyclopædia Britannica*, 9th edition.

CELLULAR, a. sĕl'ŭ-lĕr [L. *cel'lula*, a little cell—from *cella*, a hiding-place (see CELL)]: consisting of small cavities

CELLULAR PLANTS—CELLULOSE.

or hollows. CEL'LULATED, a. -lū-tēd, formed with cells. CELLULE, n. sēl'ūl, a little cell. CELLIF'EROUS, a. -līf'ēr-ūs [cell, and L *fero*, I carry, I bear]: producing cells. CEL'LULIF'EROUS, a. -ū-līf'ēr-ūs [L. *cel'lula*, a little cell, and *fero*, I bear]: producing little cells. CELLULINE, n. sēl'ū-līn, or CELLULOSE, n. sēl'ū-lōs, a substance forming the cell-walls of plants, and the chief part of woody tissue: ADJ. containing cells. CELLULAR TISSUE, tissue formed by the union of minute globules or bladders, named 'cells,' 'cellules,' 'vesicles,' or 'utricles'; an aggregation of minute membranous vesicles filled with fluid: see CELL THEORY (*Vegetable Histology*).

CELLULAR PLANTS, sēl'ū-lēr: plants consisting entirely of cellular tissues without proper vessels of any kind. It was formerly attempted by De Candolle and others, to unite all the lowest plants destitute of vascular tissue (see CELL THEORY, *Vegetable Histology*) under the general title of *Cellulares*, as opposed to the *Vascularcs*, including all the higher plants. Although this classification is long disused, the term 'cellular plants' is often employed to distinguish the fungi, algæ, lichens, characeæ, liverworts, and mosses (q.v.), from the higher or vascular cryptogams—ferns, horsetails, lycopodiaceæ and selaginellæ, and isoeeteæ. (See Sachs's, Prantl's, or other recent *Manual of Botany*.)

CELLULOID, sēl'ū-loyd: a hard, perfectly homogeneous, compact substance, closely resembling ivory, produced by the action of strong nitric acid upon cellulose. Cotton, wool, linen, paper, or other substance largely consisting of cellulose, is immersed in nitric acid; and the result is a mixture of two nitro-celluloses. This product, of which collodion is a solution in alcohol, may be dissolved under pressure at moderately high temperatures in camphor, when C. is obtained. C. becomes plastic at 125°. If coloring matter be mixed with the C. during manufacture, artificial coral, amber, malachite, etc., result. C. is an excellent material for making backs of brushes, handles of knives or umbrellas, combs, and a vast number of useful and ornamental articles.

CELLULOSE, sēl'lu-lōs: substance secreted by the living protoplasm of a vegetable cell to form its investing membrane or cell-wall. For account of mode of formation of ligneous, corky, and colloid change, mode of arrangement and union in cell-walls, etc., see CELL THEORY (*Vegetable Histology*). Pure C. consists of carbon, hydrogen, and oxygen in the proportions $C_6H_{10}O_5$. Though it is not yet exactly known how it is formed by the living cells, there is no doubt that grape-sugar, starch, and inuline (which are all of similar chemical constitution), as well as fats, may all serve as the raw material, and like them it is frequently stored in seeds, tubers, etc., as reserve materials, to be afterward digested by an appropriate ferment and applied to the nutrition of the plant-cells when these commence active growth. It is easily recognized by the blue color which it assumes when treated successively with

CELOTOMY—CELT.

dilute iodine solution and strong sulphuric acid. Cornpith cellulose is an American invention, having the property of expanding when brought into contact with water, and for this reason is used between the steel plating of war vessels for protection against sinking. When a shot penetrates the hull the cellulose swells, completely filling the hole. Among vessels thus protected in the U. S. navy are the *Alabama*, *Illinois*, *Kearsarge*, and *Kentucky*.

CELSUS, *sĕl'sŭs*: Epicurean philosopher, but tinged with Platonism, lived in the 2d c. after Christ, and wrote, after 150, under the title *Logos Alethes* (the True Word), the first considerable polemic against Christianity. The book itself has perished; but considerable fragments have been preserved as quotations given by Origen in his answer, *Contra Celsum*, in eight books. In the fragments—which are very interesting, as showing the views of a heathen philosopher in regard to Christianity—C., with wit and acuteness but without depth or earnestness of thought, prefers against the new religion charges of unphilosophicalness and blind credulity; and especially endeavors to convict Christians of self-contradiction in their spiritual doctrine contrasted with their anthropomorphic representations of Deity; in their religious arrogance contrasted with their confession of sinfulness; and in their views of the necessity of redemption. He also reproaches Christians with their party divisions and ever-varying opinion. With regard to his own positive doctrines he speaks of evil as necessary and eternal, as an essential property of the material world (*hyle*), sin as something that can never be entirely removed, and least of all, through a vicarious sacrifice. He charges Christians with having wilfully altered their sacred writings.

CELSUS, AULUS CORNELIUS: Latin physician and writer who lived probably in the reign of Augustus. He was called the Roman Hippocrates because he generally followed the great 'Father of Medicine,' and introduced the Hippocratic system among the Romans. C. wrote not only on medicine, but also on rhetoric, history, philosophy, the art of war, and agriculture. His style is succinct and clear, but full of Græcisms. The only great work of his which survives is the *De Medicinâ*, divided into eight books. The portions relating to surgery are exceedingly interesting and valuable, because C. has there given an account of the opinions and observations of the Alexandrian school of medicine. The first edition of the *De Medicinâ* appeared at Florence, 1478. C.'s works have been translated into several modern languages. A translation into English was made by Dr. Grieve, London, 1756. Among the best editions are those of Krause (Leip. 1766), Dr. Milhigan's 2d ed. (Edin. 1831), and one at Cologne, 1835.

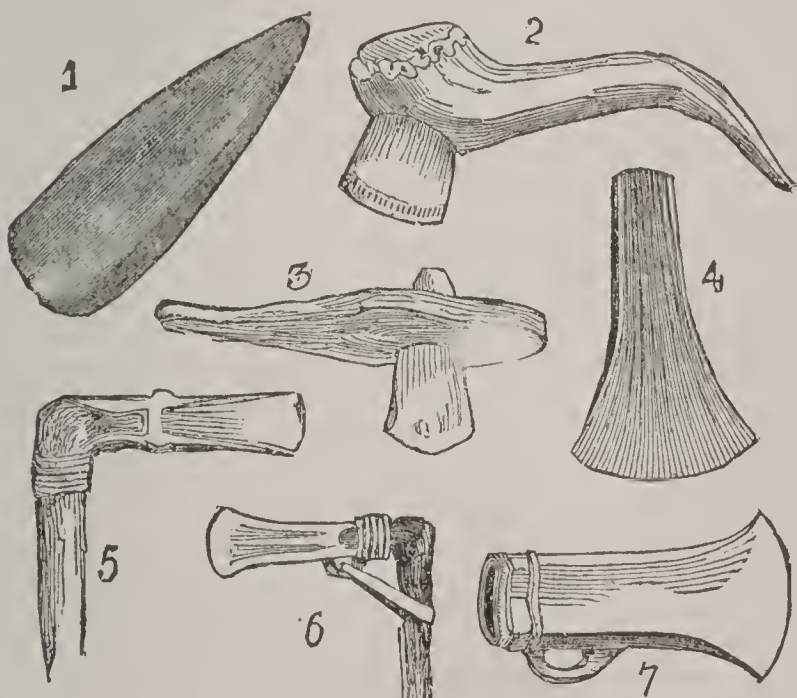
CELT, n. *sĕlt* or *kĕlt* [L. *Celtæ*; Gr. *Keltaî*, the Celts: W. *Celtiad*, an inhabitant of the wood or covert—*lit.*, one who in-

CELT.

habits wood and wild fastnesses]: one who speaks one of the Celtic languages, as the *Gaels* of Ireland and Scotland, and the *Kymry* of Wales and Bretagne; one of the great parent stock of southern and western Europe; a stone or bronze cutting instrument found in ancient barrows or tumuli. **CELTIC**, a. *sĕl'tik* or *kĕl'tik*, pertaining to a Celt: N. the language of the Celts. **CEL'TICISM**, n. *-tĭ-sĭzm*, a custom of the Celts, or an idiom of their language.

CELT [Lat. *celtis* (?), a chisel]: name by which certain weapons or implements of the early inhabitants of w. Europe are known among archæologists. Celts are either of *stone* or of *bronze*.

Stone celts vary in length from about one inch to 22 inches; but the most common size is from six to eight inches in length, and from two to three and one half inches in breadth. They are made of almost every kind of stone and show considerable diversity of shape, almost all, however, having more or less resemblance to the muscle-shell. Fig. 1. in the accompanying wood-cut shows a stone C. of the better kind. The ruder celts are generally of slate, shale, schist, or grit; the finer, of flint, porphyry, greenstone, syenite, or agate. Many of the finer celts are beautifully shaped and highly polished. A remarkable example of this class, the property of Sir Coutts Lindsay, found near St. Andrews, Scotland, is described by Sir David Brewster in the *Philosophical Journal* for 1823. Recently, a class of celts found in the later geological strata have excited much interest as well among archæologists as among geologists. They are obviously of the same type with the more com-



Celts.

mon celts, but of ruder construction, as if fashioned by a more barbarous people. The stone C. was fastened into a handle of horn, bone, or wood, as shown in the accompanying wood-cut. Fig. 2 represents a C. of serpentine, with a handle of deer-horn, found in one of the Swiss

CELTIBERI.

lakes, 1859, July. Fig. 3 represents a stone C. with a wooden handle, found in the county of Tyrone, Ireland.

Bronze celts vary in length from about one inch to eight or ten inches, the usual length being about six inches. They are sometimes ornamented with rudely incised lines or circles, and have occasionally been found wrapped up in linen, or inclosed in bronze cases or sheaths. They show much greater diversity of shape than the stone celt. As many as four classes have been distinguished by archaeologists—1st. The simple wedge-shaped C., most nearly resembling the common form of the stone C. as in the accompanying wood-cut, fig. 4. 2d. The wedge-shaped C. with sides more or less overlapping, and a stop-ridge or elevation between the blade and the part which received the handle, as fig. 5. 3d. The wedge-shaped C. with sides greatly overlapping, with or without the stop-ridge, but with a loop or ear upon, and parallel to, its lower surface, as in fig. 6. 4th. The socketed C. or the C. with a hollow to receive the handle, and generally, with a loop or ear upon its lower surface, as in fig. 7.

Both stone and bronze celts were probably used for several purposes, serving for chisels, adzes, and axes, as well as for weapons of war, like the stone hatchets of the South Sea Islanders. In more than one instance a bushel of bronze celts has been discovered at one spot.

CELTIBERI, *sĕl-tĭ-bĕ'rĭ*: a powerful people of ancient Spain, supposed to have sprung from a blending of the Iberians or Spanish aborigines with Celtic invaders from Gaul. The C. inhabited a large inland district of the peninsula, corresponding to the s.w. half of Aragon, nearly the whole of Cuença and Soria, and a great part of Burgos, but the name Celtiberia had often a wider signification, including the country as far s. as the sources of the Guadalquivir. The C. were divided into four tribes, and were unquestionably one of the bravest and noblest peoples in the peninsula. Their cavalry and infantry were equally excellent. For many years they withstood the efforts of the Romans to subdue them, and it was not till after the campaigns of Sertorius that they began to adopt the Roman language, dress, and manners.

CELTIC NATIONS.

CELTIC NATIONS, *ælt'ik* or *kelt'ik*: one of the groups of the great Aryan (q.v.) family. It was formerly held that the Celts were the first inhabitants of Britain. Now it is held by many that there always was, and still is, in Britain a large element of pre-Celtic and non-Aryan blood, variously called Ivernian, Silurian, or Euskarian. Rhys (in *Celtic Britain*, 1882) holds that the Northern Picts were wholly Ivernian; and he departs also from current views by holding that Wales and Cornwall were originally occupied by Goidelic Celts, but were subsequently overrun by Cymri, whose tongue Welsh and Cornish adopted.

Languages.—In addition to the English, and retreating before it, there are at present four languages spoken in the British Isles—the Irish, the Highland Scotch (or Gaelic), the Manx, in the Isle of Man—all three nearly related to one another, and constituting the northern (Erse, Gadhelic) branch of the Celtic languages; while the fourth language, the Welsh, constitutes, together with the Cornish of Cornwall (extinct since 1778) and the Bas Breton of Brittany, the southern (Briton, Cymric, Cambric) branch of the Celtic languages. The remains of the language of the Gauls or Celts, the ancient inhabitants of France, closely resemble the British and Gadhelic idioms; hence the name Celtic languages has been applied to the whole of them. The Celtic idioms belong to the Indo-German (Aryan) family, as their numerals show. Compare

Old Irish.	Old Welsh.	Sanskrit.
1. óin	un	êka
2. dá	dou	dvâu
3. trí	tri	trayas
4. cethir (c = k)	pedwar	chatvâras
5. cóc	pimp	panchan
6. se	chwech	shash
7. secht(n)	seith	saptan
8. oct(n)	wyth	ashtan
9. noi(n)	nau	navan
10. deich	dec	daçan
20. fichet	ugeint	vingati
100. cét	cant	gata

The Gaulish was nearer to the Cymric branch, its numerals 4 and 5 having been *petor*, *pempe*. There are a few Gaulish inscriptions which show a declension with full inflections; in old Irish five cases still exist, but the terminations are very much mutilated; in Welsh, they have disappeared. Thus, the Gaulish name *Segomaros* is declined: gen. *-ri*, dat. *-ru*, acc. *-ron*: the old Irish, *fer*, a man, has the gen. *fir*, dat. *fuir*, acc. *fer*, voc. *fir*; while the corresponding Welsh *gwr* is inflexible. Hence it follows that the pseudo-simplicity of the Welsh is the result of grammatical decay, common in all Aryan languages, and does not at all warrant Latham's theory, that the Celts branched off from the primitive Indo-German nation before the development of case inflections.

History.—Of the separation of the Celts from the other Aryans or Indo-Germans, and their early migrations to western Europe, no record has come down, the stories about Milesian colonies in Ireland, and migrations from Troy into Wales, being simply monkish fictions. At the dawn of history, we find the *Gauls* (Galli, Celtæ, *Galatai*)

CELTIC NATIONS.

occupying France (Gallia), which was divided into *Aquitania*, between the Pyrenees and Garonne; *Gallia Celtica* proper, between Garonne and Seine; and *Belgica*, from the Seine to the Rhine. The land about the *Rhone* being more early conquered by the Romans than the rest, was set apart by them under the name of *Gallia Narbonensis*, or *Gallia Lugdunensis* (from the towns Narbo and Lugdunum, Narbonne and Lyon). The whole of the four was called *Gaul beyond the Alps* (*Gallia Transalpina*). A great many tribes of Gauls had settled in Lombardy, where they founded *Mediolanum* (Milan), and which therefore took the name *Gallia Cisalpina* (Gaul this side the Alps). Other Gauls had penetrated into Spain, where they became mixed with the native Iberians, and thus gave rise to the *Celtiberians* about the river Iberus (Ebro). Numerous hosts migrated across the Rhine, occupied s. Germany and Bohemia, and, following the course of the Danube, some invaded Thrace and Greece (B.C. 278), but being repelled the main body of them settled in Asia Minor, in the province called after them *Galatia*. The Romans found the Gauls at first very formidable enemies; Rome itself was burned by them (B.C. 389), but gradually the Romans conquered first *Gallia Cisalpina* (B.C. 222), then *Gallia Narbonensis* (B.C. 112). and lastly, Cæsar subjected all France (B.C. 52), after which the Gauls soon became Romanized. The Gauls of Asia Minor, for a long time the terror of all the neighborhood, were defeated by the Romans (B.C. 187), and their land finally made a province of the empire (B.C. 25).—The *Britons* (*Britanni*; Welsh, *Brython*) were little known before Cæsar's two unsuccessful expeditions into Britannia; the country was conquered by the Roman general Agricola (A.D. 78–84), who secured the new province against the inroads of the Caledonians of Scotland by a fortification across the Scotch Lowlands, between the Forth and the Clyde, afterward removed by the emperor Hadrian further southward, to between Solway Firth and the mouth of the Tyne. The Britons were so much influenced by Roman civilization—they were also early converted to Christianity—that the heathen Angles and Saxons, who conquered them in the 5th and 6th c., called them *Welsh*; a name which, with the other Teutons, applies to all nations speaking languages of Latin descent. A few of the Britons maintained their independence in Cornwall, Cumberland, and in the mountains of *Wales*. On the last, the name Welsh was ultimately fixed by the English; they themselves, however, called their nation *Cymro*, pl. *Cymry* (a compound of *cyn*, with, in common, and *bro*, land = having a common country, countrymen, in contradistinction to the foreign invader), a name which has nothing to do with Cimbri and Cimmerii. The Welsh remained independent under different petty princes till 1282, when Edward I. conquered them. A part of the Britons went over in the 4th c. to France, where they took possession of *Brittany*, which maintained a doubtful independence under dukes of its own till about 1500.—Whether the *Caledonians*, the oldest inhabitants of Scotland. were Celts of the Cymric or Erse

Branch is unknown. After the 3d c., their name disappears, and we hear, instead, of the *Scoti* and *Picti*. As to the latter, the same doubt prevails; but the *Scoti* were emigrants from Ireland, both *Scotus* and *Gadhelus* being common national names of the old Irish. From *Gadhel*, the modern *Gael*, *Gaelic* is derived, which has nothing to do with the name of the Galli.—*Ireland* (*Hibernia*, whence the modern *Eirinn* is derived) enters into the light of history with its conversion to Christianity by St. Patrick (A.D. 460). The four centuries following on this event are the brightest period in its history. Ireland was then the seat of piety and learning, and sent forth numerous missionaries, by whom many monasteries, centres of civilization, were founded—as *Iona*, in Scotland, by Columba (563); *St. Gall*, by Gallus (615); *Würzburg*, by Kilian (687). In the 7th c., we find Irish bishops at Ratisbon; and *Virgilius* (Feargal), (died 784), Bishop of Salzburg, played no small part in the ecclesiastical history of Germany. But Ireland remained politically divided among many princes, and so became an easy prey of those ‘black heathens’ the Scandinavians, whose invasions began 795, and who founded Norse kingdoms at Dublin, Waterford, Limerick, etc. In the fierce battles between the two nations, the prosperity of Ireland rapidly declined, and the English conquest (1171) only completed the ruin. The Isle of *Man*, inhabited by a branch of the Irish, after having been subject to Welsh, Scotch, Norse princes in turn, acknowledged England’s sovereignty in 1344.

Religion and Mythology.—A few notices in the classics and the Latin inscriptions of Gaul are the rather meagre sources of information on the Celtic paganism. As three of the chief gods, Lucan mentions *Teutates*, *Hesus*, and *Taranis*, all of them worshipped with human sacrifices. *Taranis* reappears as *Jupiter Taranucus* on an inscription; and from this identification with Jupiter, as well as from the fact that in Welsh *taran* means thunder, we may infer that he was the god of the thunderstorm. Other gods frequently occurring on inscriptions are *Apollo Grannus*, *Apollo Belenus*, *Mars Camulus*, *Minerva Belisama*, etc., all of them, however, empty names to us. A remarkable feature in Gaulish religion was the worship of certain *Mother Goddesses* (called on the inscriptions *Junones*, *Matronæ*, *Deæ Matres*, *Campestres*, *Nymphæ*). They are frequently connected with special localities, as in the inscriptions dedicated to *Matronis Laniliabus*, *M. Hamavehis*, *M. Rumanehabus*, and on the one in Gaulish: *Matrebo Namaucicabo*, ‘to the Mothers of Nîmes.’ To this class apparently belongs the *Dea Nehalennia*, once represented on a relief with a basket of fruit, and a dog for companion. Mela, the geographer, speaks of an island in the Atlantic, near Gaul, where there was an oracle superintended by nine maidens, who could cause storms, take the form of any animal, could cure what otherwise was incurable, and predicted the future. These goddesses, at once motherly and maidenly, residing in field and wood (*campestres*, *nymphæ*), givers of plenty and prophets of the future, are

the heathen prototypes of the *fées* (fairies, as distinguished from 'elves') of the middle ages. The 'little folk' were known to the Gauls under the name of *Dusii*. The Gauls believed in the existence of individual tutelary genii, as a stone of Lausanne shows, being erected by three Gauls *Sulfis suis* (hence our *sylph*?). The belief in the transmigration of souls was common among the Gauls, or at least their priests the *Druids*, so called from their performing sacred rites in oak-woods [Welsh, *derw*, an oak; *derwydd*, a Druid]. These Druids were also the depositaries of knowledge and tradition, and constituted, in Gaul at least, a powerful hierarchy, with a supreme pontiff. Druids are found both in Ireland and in Wales, and the *fées* abound in Welsh tradition; but it is very doubtful whether the superhuman beings appearing in the Welsh poems of the 12th and 13th c.—such as *Hu Gadarn*, the reputed founder of Bardic institutions (see beneath)—are genuine relics of the British religion. The belief in transmigration lasted very long, as the mediæval Welsh tale of *Taliesin* speaks distinctly of Taliesin's successive existences. Though not properly mythological, we may mention here the romantic stories of the Britons about King *Arthur* and his knights. He is first mentioned by Nennius in the 9th c.; but his fable was further developed in the next centuries both in Wales and Brittany, then embodied in Geoffrey of Monmouth's *Historia Britonum*, which served as the groundwork of the French *Roman de Brut* of Wace. Through these works, and partly, also, through the direct influence of the oral traditions of Brittany, it passed into French literature, and thence spread over all Europe.

Literature.—The Gauls learned writing from the Greeks; later, they employed the Roman alphabet, as do the Welsh and Irish, the now used Irish character being nothing but the common Anglo-Saxon form of the Latin alphabet. Besides, however, the Irish claim an old character of their own, the Ogham, in which the letters are represented by a number of vertical strokes put in a right angle to a horizontal line, or else by horizontal strokes to a vertical line. Some of the Ogham inscriptions are said to be older than Christianity. Even more doubtful is the antiquity of a Welsh so-called Bardic alphabet, in which there seem to be no inscriptions extant, and which is, at any rate, an alteration of the Roman character. A feature common to all Celts is the existence of a kind of literary order, the *Bards* (q.v.), poets and guardians of tradition—in Gaul, nearly related to or part of the priesthood; in Wales and Ireland, in immediate connection with the kings.—A *Gaulish* literature there certainly was, as Cæsar informs us that, in the schools of the Druids, the young men used to learn by heart a great number of verses on theological and historical subjects. But these poems were never written down. It is highly probable that rhyme, first used by St. Ambrosius (397) in his hymns, is of Gaulish origin, this being the common form even of the oldest Irish and Welsh poems.—The *Irish* literature began with the conversion, but our existing manuscripts are not older than the 9th or 8th c. Inter-

CELTIC NATIONS.

linear versions of biblical and other theological, or of grammatical writings are about the oldest manuscripts, many of which, in consequence of the missionary zeal of the nation, are found at St. Gall, Milan, and other continental places. Then there are ecclesiastic *hymns*, one of the oldest ascribed to Patrick. A renowned author of poems, in the 10th c., was Eochad O'Flin. Secular poetry of ancient times there has come down to us none, but we have testimonies as old as the 12th c., of the existence of such, ascribed in a general way to the old pagan hero Oisín, son of MacCumhal. The existing specimens, mostly warlike—except some dialogues between Oisín and St. Patrick—are recent. Those Gaels that went over to Scotland, took, of course, similar traditions with them. With a partial knowledge of these, Macpherson composed (1765) the work which he declared (rather loosely) to be an English translation of the songs of the old Scotch poet Ossian, son of Fingal (the true Oisín was an Irishman). The would-be Gaelic original of Macpherson's work, edited 1807, is either a compilation or a retranslation. Of Irish prose, the annals are the most important part: first, those of Tighernach (1088), then the *Annales Inisfalienses*, *A. Ultonienses*; lastly, the *Annals of the Four Masters*, being a compilation made (1634) from older sources chiefly by four Franciscans, beginning with 242 after the deluge, and ending with A.D. 1616.—The oldest remains of *Welsh* literature are the songs, so far as they are genuine, of the bards of the 6th c.—*Llewarch Hen*, *Aneurin*, *Taliesin*—having chiefly the life and deeds of contemporary princes for their subject, but few in number. In the 10th c., we have the collection of laws by Howel Dda. The historians Gildas and Nennius, of the 9th c., wrote in Latin.

The great age of *Welsh* literature is the 12th and succeeding centuries, when the energies of the nation were roused in the struggle with England. In this contest the bards played a conspicuous part as agitators. After a long interval we hear again of a great bard, *Meilyr* (1100); many follow, among whom *Kynddelw* (1200) deserves special mention, both as a poet (we have 49 pieces of his) and as a patriot. *Welsh* poetry consists in—1. Political lyrics, war-songs, songs in praise of chieftains, elegies on the same. 2. Religious hymns. 3. Pseudonymous poems ascribed to *Merddin* (Merlin), the mythical enchanter, and *Taliesin*, the old bard, having generally the form of prophesies on the struggle between the Saxons and *Welsh*, and the ultimate triumph of the latter. Thus, in the *Avalennau* (or apple-trees), attributed to Merlin, the *Welsh* nation is enigmatically represented under the image of 'seven score and seven sweet apple-trees,' whose fruits, princes (viz., the English) wish in vain to despoil. 4. The triads, short memorial (?) verses in which *three* remarkable events, subjects, or persons are respectively mentioned (hence the name), embracing history, theology, jurisprudence. 5. Dialogues of dramatic character. They were—apparently now lost—also miracle plays actually represented.

The only remarkable remnant of *Cornish* literature comes

CELTIS—CEMBRA NUT AND CEMBRA PINE.

under this head, being three ecclesiastical plays of the 14th c.—the *Creation*, the *Passion*, and the *Resurrection*.—In Welsh prose we have first the chronicles. Geoffrey's chronicle, though Latin, is thoroughly national; then there is that of Caradoc, and the *Liber Landavensis*, a history of the bishops of Landaff down to 1132. Further, we have the *Mabinogion* (Children's Tales), romantic stories. There are, besides, some scientific writings, and one on Welsh prosody by Edeyrn (1260). There are separate articles in this work on the Welsh language and literature (q.v.), as on Gaelic (q.v.), and on Irish (q.v.).—The *Breton* or *Armorican* tongue has no monuments left of its most ancient literature. Of Middle Breton there remain two miracle plays of the 14th c., a prayer-book, and a few fragments. The modern Breton, still commonly spoken in Brittany, especially lower or western Brittany (see BRETAGNE), has four well-marked dialects. Its literature is very rich in short historical, heroic, and mythological ballads, love songs and festal verses, and religious poems; also tales illustrating the very copious folk-lore of the race. A most valuable collection is M. de Villemarque's *Barzaz Breiz* (English transl. by Taylor, 1865); another is M. Luzel's *Bepred Breizad* (1865), and his series of Arthurian tales.

Celtic influences.—The Irish missions did much for European civilization; while the traditions of the Britons deeply influenced mediæval literature. The one great defect of the Celts is incapacity for political organization. Their very enthusiasm, lively feeling, and vivid imagination, have ever prevented them from taking coolly and deliberately those measures which lead to national unity; hence it is that they gave way before the more practical Roman and Teuton. But while they lost their independence, and oftentimes their very language in the contest with the foreigner, whose strong hand molded them into national unity, yet they reacted on him in their turn. They are fast disappearing by merging into the English; but if the quiet resolution, the sturdy common sense, the talent for public life, state organization, and political dominion, that characterize the modern British stock, are altogether Teutonic—on the other hand their genuine refinement of manner and feeling, and their high poetical susceptibilities, are to no small extent due to the admixture of Celtic blood.

CELTIS: see NETTLE-TREE.

CEM'BRA NUT AND CEMBRA PINE: see PINE.

CEMENT.

CEMENT, n. *sěm'ěnt* or *sě-měnt'* [F. *cément*, cement—from L. *cāmen'tum*, chips of stone, cement—from L. *cādēre*, to cut]: the substance that unites two bodies together, or the parts of a broken thing; bond of union; mortar; a term denoting the hard external tissue of the lower part of the tooth, beginning where the tooth enters the gum, and the enamel terminates: V. *sì-měnt'*, to unite by a glutinous substance; to unite firmly and closely; to cohere. **CEMENT'ING**, imp. **CEMENT'ED**, pp. **CEMENT'ER**, n. one who. **CEMENTATION**, n. *sěm'ěn-tā shŭn*, the act of cementing; a process by which iron is converted into *Blistered steel* (q. v.). **CEMENTATORY**, a. *sě-měn'tā-tēr-ĭ*, or **CEMENTITIOUS**, a. *sěm'ěn-tĭsh'ŭs*, having the quality of cementing. **ROMAN CEMENT**: see under **ROMAN**. **PORTLAND CEMENT**: see under **PORTLAND**.

CEMENT': substance used to make the surfaces of solid bodies adhere to one another; it is applied in a liquid or viscous state, and hardens after the surfaces are brought together. When fused metals or alloys are used in this manner they are called solders. There is a great variety of C. derived from animal, vegetable, and mineral substances. The animal cements are composed chiefly of gelatine and albumen as their bases. Joiners' glue is an example: see **GLUE**. The binding materials of vegetable cements are gums, resins, and wax. The mineral cements are chiefly of lime and its compounds. In many cements, animal, vegetable, and mineral substances are combined. The simplest of the mineral cements is plaster of Paris, used for uniting slabs of marble, alabaster, and many similar purposes. It is mixed with water to the consistence of thick cream, and then applied. This hardens rapidly, but is not very strong. Its hardening depends upon the true chemical combination of the water with anhydrous sulphate of lime, of which plaster of Paris is composed, and the formation thereby of a solid hydrate. The plaster of Paris may be mixed with thin glue, with diluted white of egg, or a solution of size or gum, instead of water, and is strengthened thereby.

Keene's marble cement is prepared by steeping plaster of Paris in a concentrated solution of alum, then recalcining and powdering. This powder is mixed with water in the same manner as plaster of Paris. It is used as a stucco for internal decorations, takes a high polish, and, when colored, forms beautiful imitations of mosaic, marbles, scagliola, etc.

A mixture of paper-pulp, size, and plaster of Paris in equal proportions, forms a useful cement, and is used also as a sort of papier-mâché for casting into architectural ornaments, etc.

Common mortar is one of the most important of the lime cements. It is composed of slaked lime, or mixture of this with sand; its hardening depends upon the slow formation of carbonate of lime by the absorption of carbonic acid from the atmosphere, and a partial combination with the silica of the sand. Cow-hair is sometimes mixed with it, to bind it when laid in masses. In order to obtain a fine, smooth

CEMENT.

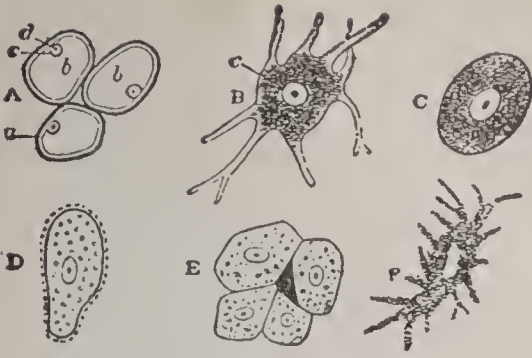
paste, which is required for good mortar, the lime should be slaked rapidly by adding about three parts of water to one of lime; if the quantity of water is too small a coarser or semi-crystalline hydrate of lime is produced by the slaking. For the mode of applying mortar, see BRICKWORK.

Ordinary mortar, when exposed to the continuous action of water, softens and disintegrates, and some of the lime dissolves away. Lime which contains 20 or 30 per cent. of clay, or finely-divided silica, produces a mortar not liable to this softening, but possesses the property of hardening under water; such lime is called *hydraulic*, and the mortar made from it hydraulic cement or mortar.

Puzzolana, a porous lava found at Puzzuoli, near Naples, has been long celebrated for its property of forming a hydraulic cement, when mixed with ordinary lime. It is mainly composed of silicates of alumina, lime, and soda. Portland cement, so named from its resemblance to Portland stone when dry, is made from clay found in the valley of the Medway, which is intimately mixed with the neighboring chalk, and then burned. Roman cement is similar to the Portland, but of darker color; it contains a larger proportion of clay, and solidifies more rapidly. The C. should be mixed with a sufficient quantity of water to form a moderately thick paste; the surfaces to which they are applied should be well wetted, and the cement kept slightly moist until it hardens. The solidification of hydraulic cements depends upon the combination of the lime with the silica and alumina, forming first a hydrated compound and finally a true silicate. They expand slightly in solidifying.

The following receipts include some of the most useful and reliable cements applicable to the purposes specified: For water-tight joints, such as slate cisterns, aquaria, etc., and for uniting broken pieces of stone, and filling up metallic joints—take equal parts of red and white lead, and work them into a stiff paste with boiled linseed oil. When used for metal joints it should be made rather thin, and both pieces of metal, as well as the washer, well smeared with it. This cement hardens slowly, but becomes ultimately of almost flinty hardness. An aquarium, holding 15 gallons of water, made of plate-glass, cemented at the angles to mahogany columns with this composition, has stood without leaking for above three years, in spite of much rough handling and moving about; and the cement has become so hard, that it is difficult to scratch it with a knife.

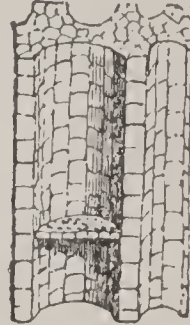
Cement composed of ox-blood thickened with finely-powdered quicklime, is used by coppersmiths, for securing the edges of rivets of copper boilers, and for steam-joints. Another cement for steam-joints is made with borings or turnings of cast-iron mixed with a little sal ammoniac and flour of sulphur. It should be stirred up with a small quantity of water, just sufficient to moisten it, then rammed into the joint, which should be bolted up as tightly as possible; 5 lbs. of iron borings to 2 oz. of sal ammoniac,



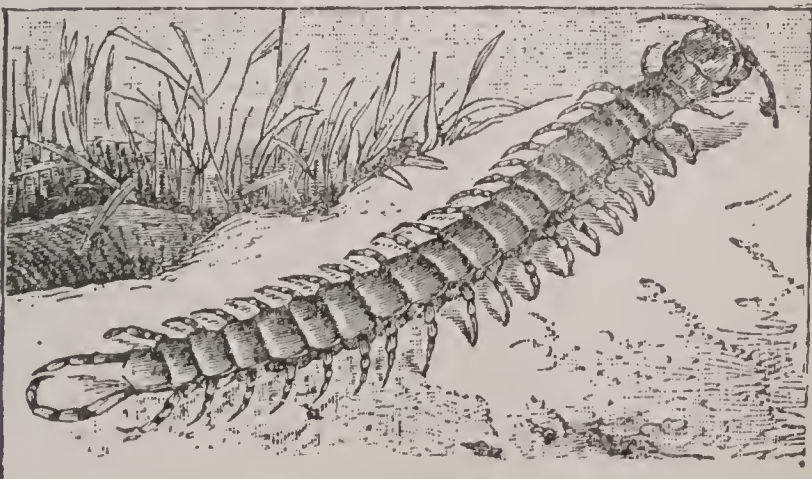
Centaur.—Antique statue in Vatican Museum.



Cenotaph of Burns, Banks of Doon.



Cellular Tissue in Plants.



Giant Centipede (*Scolopendra gigas*).

CEMENT.

and 1 oz. of sulphur, are the proportions recommended. A cement of this kind may be made of 4 lbs. iron borings, 2 lbs. pipe-clay, and 1 lb. of powdered earthenware fragments made into a paste with salt and water; or 2 parts litharge in fine powder, 1 part very fine sand, and 1 of quicklime that has slaked spontaneously in a damp place. These should be mixed, and kept from the air, and made into a paste with boiled linseed oil when about to be used. This is a valuable cement for steam-joints, for mending cracks in boilers, ovens, etc. Beale's patent fire-proof cement, for similar purposes, is composed of chalk, 12 parts; lime and salt, each 4 parts; Barnsey sand, 2 parts; iron filings or dust, 1 part; and blue or red clay, 1 part. These are ground and calcined together.

Electrical Cement—so called from its use in uniting the cylinders of electrical machines to their axes, and for a variety of similar purposes—is composed of 5 lbs. rosin, 1 lb. each of bees-wax and red ochre, and 4 oz. of plaster of Paris: this is Singer's formula. A cheaper cement of this kind may be made from 14 parts rosin, 2 red ochre, and 1 plaster of Paris. These should be melted together till the frothing ceases and the composition runs smoothly. This is applicable to a variety of purposes, where a cheap and tolerably adhesive cement is required. It will serve as bottle-wax for sealing the tops of corks; but this is usually prepared from 4 parts rosin with 1 of tallow or suet, and red ochre or other coloring matter added.

For mending earthenware and china, etc., a variety of cements are recommended. For ornamental glass or china, not subjected to heat or rough usage, Canada balsam that has evaporated until rather hard, is a very useful cement; from its transparency it makes an almost invisible joint. The surfaces should be slightly warmed, and the balsam brushed over them, after which they should be kept pressed together for a short time. Thick copal or mastic varnish may be used in the same manner. Gum shellac, dissolved in spirits of wine in sufficient quantity to form a treacly liquid, forms a stronger cement than the above, but its color is objectionable for some purposes. The shellac may be dissolved in naphtha, but is not equal to that in spirits of wine. The *liquid glue* sold in the shops is usually prepared in this manner, another kind is made of a mixture of the solutions of shellac and India rubber. The cement sold in sticks at fairs and in the streets by loquacious itinerants, is shellac or gum mastic fused and molded into a convenient form, and is one of the most useful cements when properly applied, by heating the surfaces to be joined just sufficiently to fuse the shellac, and then smearing them thinly with it, and pressing them together. If shellac is heated much above its fusing-point, it becomes carbonized and rotten, and therefore great care must be used in fusing any composition of which it is an ingredient. The *marine glue*, a mixture of shell-lac and India rubber, is a remarkable cement, and when applied, as the last, with the precautions just alluded

CEMENT.

to, is so strong that glass or china cemented with it, and then dashed on the ground, or otherwise broken again, will give way in any part rather than that cemented. This cement may be purchased ready made. For the mode of preparing it, see GLUE.

Universal Cement, used for the above and many other purposes, is prepared as follows: Curdle skim-milk with rennet or vinegar, press out the whey and dry the curd at a very gentle heat, but as quickly as possible. When it has become quite dry, grind it in a coffee or pepper mill, and next triturate it in a mortar until reduced to a very fine powder. Mix this powder with $\frac{1}{10}$ th of its weight of new dry quicklime, also in very fine powder, and to every ounce of the mixture add five or six grains of powdered camphor; triturate the whole well together, and keep it in small, wide-mouthed phials well corked. When required, make it into a paste with a little water, and apply it immediately.

Cheese Cement is similar in composition and uses. Take two parts of grated cheese and one of quicklime in fine powder; beat these together with white of egg to form a paste, and use immediately.

The following is the reputed formula for preparing the *Armenian or Diamond Cement*, used by the Armenian jewelers for attaching diamonds, etc., without any metallic setting: 'Dissolve five or six bits of gum-mastic, each the size of a large pea, in as much rectified spirit of wine as will suffice to render it liquid; and in another vessel dissolve as much isinglass, previously a little softened in water—though none of the water must be used—in French brandy, or good rum, as will make a two-ounce phial of very strong glue, adding two very small bits of gum galbanum or ammoniacum, which must be rubbed or ground till they are dissolved. Then mix the whole with a sufficient heat. Keep the glue in a phial closely stopped, and when it is to be used set the phial in boiling water.' This cement has a great reputation, but experience does not always confirm it. The above, and several other receipts have been tried with very little success. It is doubtful whether the true method of preparing it is known in western countries; perhaps it remains one of the oriental trade-secrets. White of egg, thickened with finely powdered quicklime, forms a useful cement, especially if the cemented article is warmed for a short time in a slow oven.

Cutlers' Cement, used for fixing knives and forks in handles, is made of equal weights of rosin and brick-dust melted together; or, for a superior quality, 4 parts of rosin, 1 of bees-wax, and 1 of brick-dust.

Mahogany Cement, used for stopping cracks and holes in mahogany, may be prepared by melting 4 parts of bees-wax with 1 of Indian red, and as much yellow ochre as is found requisite to give the color. If shellac be substituted for the bees wax, and less red used, a much harder cement is made.

For *French Cement*, *Rice Glue*, and other light cements

CEMETERY—CENCI.

for joining paper articles and artificial flowers, see **GLUE : PASTE**.

CEMETERY, n. *sěm'ě-těr-ĭ* [Gr. *koimētērion*, a sleeping place—from *koimāō*, I lull to sleep : L. *cemētērium*]: a place for the burial of the dead; of late, specially, an extensive ornamental burial-ground, such as have become common since the practice of burying within and around churches was gradually abandoned (see **BURIAL**). The fine burial-grounds of the Turks, extending over large tracts adorned by cedars and other trees, may have suggested the plan to Europeans. It was first exemplified on a great scale in Paris, in which, as the largest walled town, in Europe, the disposal of the dead was long a matter of extreme anxiety and difficulty. There was at first a natural feeling of regret at the prospect of deserting places of deposit for the dead so hallowed by ancient use and recent associations as the church and the churchyard. But the new places of interment began to develop humanizing and elevating influences, in beautiful trees and flowers, natural scenery, and works of monumental art. One of the oldest established and most celebrated of cemeteries, is that of Père la Chaise (q.v.), near Paris, the arrangements of which have been generally followed in the cemeteries of Europe and America.

CENANTHY, n. *sěn-ăn'thĭ* [Gr. *kēnos*, void, empty; *anthos*, a flower]: the absence of stamens and pistils in flowers.

CENATORY, a. *sěn'a-to-rĭ* [L. *cenatorius*—from *cæna*, supper]: relating to or fit for supper.

CENCI, *chěn'che*, **BEATRICE**, called 'the beautiful paricide': lived near the end of the 16th c. ; dau. of Francesco Cenci, a wealthy Roman nobleman. She has long been the central figure of a tragic tale now discredited in many of its most impressive features. According to Muratori (*Annales*, lib. x.), Francesco was twice married, Beatrice being his daughter by the first wife. After his second marriage he treated the children of his first wife in a revolting manner, and was even accused of hiring bandits to murder two of his sons on their return from Spain. The beauty of Beatrice inspired him with the horrible and incestuous desire to possess her person ; with mingled lust and hatred he persecuted her from day to day, until circumstances enabled him to consummate his brutality. The unfortunate girl besought the help of her relatives, and of Pope Clement VII. (Aldobrandini), but did not receive it ; whereupon, in company with her step-mother, and her brother, Giacomo, she planned and executed the murder of her unnatural parent. The crime was discovered, and both she and Giacomo were put to the torture ; Giacomo confessed, but Beatrice persisted in the declaration that she was innocent. All, however, were condemned, and put to death, 1599, Aug., in spite of efforts in their behalf. Such is Muratori's narrative. Others allege that Beatrice was the innocent victim of an infernal plot. The results

CENEDA—CENSE.

of Bertolotti's investigations (*Francesco Cenci e la sua Famiglia*, 1877), based on original documents and contemporary notices, go far to deprive the story of the Cenci tragedy of the romantic elements on which Shelley's powerful tragedy mainly turns. Francesco, it would appear, was profligate, but no monster; Beatrice at the time she murdered her father, was not 16 but 21 years of age, was far from beautiful, and probably had already a tarnished moral reputation. And Bertolotti is further convinced that the sweet and mournful countenance which forms one of the treasures of the Barberini palace in Rome, is not only not the portrait of Beatrice, but was not even painted by Guido, to whom it has long been unhesitatingly attributed.

CENEDA, *cha-nā'dā*, now officially called **VITTORIO**: city of n. Italy, province of Treviso, 36 m. n. of Venice. It is an episcopal see, but is now a decayed city. Pop. 11,000.

CENIS, MONT, *mōng se-nē'*, or **MONTE CENISIO**, *mōn'-tā chā-nē'zī-o*: mountain-pass of the Alps, between Savoy and Piedmont, forming part of the water-shed between the valleys of the Doire and the Arc. The culminating point of the pass is 6,775 ft. above the sea. Schist, limestone, and gypsum, in alternate beds, compose the strata of the mountain, the vegetation of which is rich in the rarer kinds of Alpine plants. Over the pass a road was constructed (1803–10) by the Chevalier Fabbroni, under Napoleon's orders, at an expense of \$1,500,000. This is the safest, and most frequented road across the Alps. Near the pass, a railway tunnel, 7½ m. long, was finished 1870: see **TUNNEL**.

CENOBIARCH, n. *sē-nō'bi-ārk* [L. *cænōbiūm*, a convent: Gr. *archē*, government]: the head or chief of a monastery.

CENOBITE, n. *sē'nō-bīt* [mid. L. *cænobīta*, a member of a resident fraternity—from *cænōbiūm*, a convent—from Gr. *koinos*, common; *bios*, life]: one of a religious order who lives in a convent or monastery with others, and not alone, like an *anchorite* or *hermit*. **CENOBITIC**, a. *sē'nō-bīt'ik*, and **CENOBITICAL**, a. *-ī-kāl*, living in community as a monk: see **MONACHISM**.

CENOMYCE: see **REINDEER MOSS**.

CENOTAPH, n. *sēn'ō-tāf* [F. *cénotaphe*—from mid L. *cenotaph'ium*—from Gr. *kenotaph'ion*, an empty tomb—from Gr. *kēnos*, empty; *tāphos*, a tomb]: a tomb-shaped monument in honor of one who is buried elsewhere. Such monuments were originally erected for those whose bones could not be found, e.g., for those who had perished at sea. Latterly, the name came to be applied to tombs built by a man during his lifetime, for himself and his family.

CENSE, v. *sěns* [F. *encenser*, to perfume: contr. from *incense*, which see]: to perfume with burning odoriferous substances. **CEN'SER**, n. *-sēr*, a vase or pan in which incense is burned. **CEN'SING**, imp. **CENSED**, pp. *sěnst*.

CENSER—CENSORS.

CENSER, *sĕn'ser*: vase, or other sacred vessel, used for burning perfumes: see **INCENSE**. Censers were much used in the Hebrew service of the temple, but their form is not accurately ascertained, and it is probable that they varied in this respect, according to occasion. The C., called also a *thurible* [Lat. *thuribulum*, from *thus*, frankincense], is used in the Rom. Cath. Church at mass, vespers, and other offices. It is suspended by chains, which are held in the hand, and is tossed in the air, so as to throw the smoke of the incense in all directions. It varies very much in form, from a simple vase, or chaffing-dish, covered by a perforated dome, to the ornamental structure represented in the wood-cut.



Thurible.

CENSOR, *n. sĕn'sŏr* [L. *censor*, a Roman magistrate, a censor, a critic—from *censĕrĕ*, to give an opinion]: an officer in anc. Rome who registered the property of persons, imposed taxes, and punished immorality; in some countries, a person who inspects all MSS. before they are permitted to be printed or published; one given to fault-finding. **CENSO'RIOUS**, *a -sŏ'rĭ-ŭs*, or **CENSO'RIAL**, *a. -rĭ-ŭl*, given to blame or to condemn; severe in making remarks on the conduct or writings of others. **CENSO'RIOUSLY**, *ad. -lĭ*. **CENSO'RIOUSNESS**, *n.* disposition to find fault. **CEN'sORSHIP**, *n.* the office or dignity of a censor; the power exercised in some countries of superintending and revising general literature before publication, particularly periodical and political publications. — **SYN.** of 'censorious': captious; carping; cavilling; condemnatory; severe.

CENSORS, *sĕn'sorz*: name of two Roman officers of state. The office was established by Servius Tullius, fifth king of Rome. After the expulsion of the kings it was held by the consuls, special magistrates not being appointed till B.C. 443. It continued to be filled by patricians till B.C. 351, when C. Marcius Rutilus, a plebeian, was elected. Twelve years later it was enacted that one of the C. (there were always two) must be a plebeian. In B.C. 131, both C. for the first time were plebeians. The C. were elected in the *comitia centuriata*, presided over by a consul. The term of office at first lasted five years, but was shortly afterward limited to 18 months. The censorship was regarded as the highest dignity in the state, except the dictatorship. It was a sacred and irresponsible magistracy, whose powers were vast and undefined, and whose decisions were received with solemn reverence. The duties of the C. were three-fold. 1. The taking of the census, or register of the citizens and of their property. 2. The *regimen morum* (regulation of morals). 3. The administration of the finances of the state. The taking of the census [L. *censeo*, to value, to take an account of] was originally their sole function (hence their

CENSORSHIP OF THE PRESS—CENSURE.

name), and was held in the Campus Martius, in a building called *Villa Publica*. The *regimen morum* was the most dreaded and absolute of their powers. It grew naturally out of the exercise of the previous duty, which compelled them to exclude unworthy persons from the lists of citizens. Gradually the superintendence of the C. extended from the public to the private life of citizens. They could inflict disgrace (*ignominia*) on any one whose conduct did not square with their notions of rectitude or duty. For instance, if a man neglected the cultivation of his fields, or carried on a disreputable trade, or refused to marry, or treated his family either too kindly or too harshly, or was extravagant, or guilty of bribery, cowardice, etc., he might be degraded, according to his rank, or otherwise punished. The administration of the finances of the state included the regulation of the *tributum*, or property-tax; of the *rectigalia*, such as the tithes paid for the public lands, salt-works, mines, customs, etc., which were usually leased out to speculators for five years; the preparation of the state budget, etc.—See Rovers, *De Censorum apud Romanos Auctoritate et Existimatione* (Utrecht, 1825).

CENSORSHIP OF THE PRESS: term generally applied to the arrangements for regulating what may be printed, in countries where the press is not free. The simplest form of C. is when a public officer—the censor, or licenser, as he is sometimes called—reads over the MS. to be printed. Thence it is common in old books to see the word *imprimatur*—let it be printed, followed by one or more signatures. Though it has its name from an analogy with the functions of the Roman censor, the C. did not come into operation until the invention of printing. It was common to all European countries, Great Britain included. The C. was established by act of parliament in 1662, 13 Char. II, c. 33: ‘An act for preventing the frequent abuses in printing seditious, treasonable, and unlicensed books and pamphlets, and for regulating of printing and printing presses.’ This was a temporary act, renewed from time to time; and its renewal was refused in 1693, owing to a quarrel between the house of commons and the licenser. Since that time there has been, generally speaking, no restriction in Britain on what any man may publish; and a publisher is merely responsible to the law (as in the United States) if in his publication he should commit any public or private wrong. See **LIBEL, LAW OF:** also **PRESS, FREEDOM OF THE:** **BOOK TRADE:** **COPYRIGHT.**

CENSURE. n. *sěn'shúr* [F. *censure*—from L. *censūra*, severe judgment: It. *censura*]: severe judgment; the act of blaming or finding fault; reproof; an ecclesiastical sentence: V. to find fault with; to blame; to condemn as wrong. **CEN'SURING,** imp. **CEN'SURED,** pp. *-shúrd*. **CEN'SURER,** n. one who. **CEN'SURABLE,** a. *-á-bl*, worthy of blame. **CEN'SURABLY,** ad. *-blí*. **CEN'SURABLENESS,** n. the quality of being censurable; blameableness.—**SYN.** of ‘censure, v.’: to blame; condemn; reprove; reproach; upbraid; reprimand; rebuke; chide; animadvert; disapprove; judge;—

of 'censure, n.': reproof; blame; condemnation; disapproval; disapprobation; reprehension; reprimand; abuse; dispraise.

CENSUS, n. *sĕn'sŭs* [L. *census*, a registering and rating of citizens: It. *censo*: F. *cons*]: an authoritative and usually periodical enumeration of the inhabitants of a state or country. CEN'SUAL, a. *-shŭ-ăl*, of or relating to a census.—Though the Roman censors had to enumerate the people, it was only for immediate purposes of taxation, so that no accounts of the results of such enumeration has been preserved. The idea of ascertaining the numbers of the people, and the proportions in which they are divided according to sex, age, profession, rank, and the like, as statistical information, is of late origin. The first C. of Britain was taken 1801. From that time it has been taken at each period of ten years. An attempt, not entirely successful, was made to take the statistics of Ireland in 1811. Ten years later, the attempt was repeated, but the accuracy of the bare enumeration was doubtful. That of 1831, which was an improvement, was corrected three years afterward, that it might form the basis of a new system of education. The four subsequent enumerations have been very trustworthy, and have furnished besides valuable statistics regarding the agricultural condition of the country. The system of registration under a registrar-general, established in England, 1836, has given considerable assistance by supplying a staff for carrying out the enumeration, and by affording the means of checking or verifying the C. A similar registration system was extended to Scotland 1854, of which the C. of 1861, 1871, and 1881 have had the advantage. A C. must be taken for the whole empire simultaneously, otherwise it cannot be accurate. The practice is for the enumerating officer in each petty district to leave a schedule at each house, which he receives filled up, aiding, when necessary, in the filling up. The C. of 1861 was taken for the night of the 31st March. This C. supplied important, but not altogether satisfactory information, as to the educational and ecclesiastical condition of the country; neither item is now included in the C. The C. of 1861 was taken for the night of Sunday, 7th April; that of 1871 for Sunday, 2d April; that of 1881 for Sunday, 4th April, a schedule being left in each house on the Saturday, and called for on Monday. The schedule of 1881 contained compartments for 'particulars of the name, sex, age, rank, profession or occupation, condition, relation to head of family, and birthplace of every living person' who passed the night of Sunday in the house; and whether any was blind, deaf, dumb, imbecile, or lunatic. Most civilized nations take a C. at regular intervals—France, every five years (1876, '81, etc.); Belgium, every ten years (1866, '76, etc.); Austria, every ten years (31st Dec. 1880, etc.); the United States, the same (1870, '80, etc.); Germany, every five years (1st Dec. 1870 '75, '80, etc.); Norway, every ten years (1875, '85, etc.); Italy, every ten years (31st Dec. 1871, '81, etc.); Denmark, every ten years (1st Feb. 1870, '80, etc.); Spain, Portugal, Greece, irregularly. The

first C. for India was taken between 1867 and 1872, the second in 1881.

The tenth United States census was taken under the superintendence of Gen. Francis A. Walker, and with the facilities, in addition to previous legislation, afforded by the act of 1879, March 3, by which authority was given the C. office to appoint experts to examine and report concerning special topics pertinent to the general inquiry, as assigned by the supt. Census-day was appointed to be 1880, June 1, and the C. year to include the twelve months previous to that date. The special topics for which experts were chosen to investigate and report were the following: I. Fisheries; II. Mining Industries; III. Power and Machinery used in Manufactures; IV. Defective, Dependent, and Delinquent Classes; V. Social Statistics of Cities; VI. Statistics of Special Branches of Manufacture; VII. Statistics of Special Branches of Agriculture; VIII. Mortuary Statistics. The cost of the enumeration for the tenth C., exclusive of the service of specialists, was \$2,000,000; the total cost of the C. was reported \$3,860,068.67; the maximum number of the clerical force employed was 1,495. This C., completed, comprised 20 large quarto vols., many of them finely illustrated with maps, pictures, and diagrams; there were also a number of separate monographs, and the usual octavo Compendium. The 20 vols. covered the following subjects: Vol. I. Population; II. Statistics of Manufactures; III. Statistics of Agriculture; IV. Transportation; V.-VI. Cotton Production; VII. Valuation, Taxation, and Public Indebtedness; VIII. Newspapers and Periodicals; Alaska; Fur Seal Islands; Ship-building; IX. Forest Trees of North America; X. Special Reports on Petroleum, Coke, and Building Stones; XI.-XII. Mortality and Vital Statistics; XIII. Precious Metals; XIV. Mining Laws; XV. Mining Industries (exclusive of Precious Metals); XVI.-XVII. Water Power; XVIII.-XIX. Social Statistics of Cities; XX. Statistics of Wages, Necessaries of Life, Trades Societies, Strikes, and Lockouts.—It is customary in a number of the states to take a C. of the state every five years, varying in extent and comprehensiveness as regards every subject except population. In the states which took such a census 1885, the increase in population, in percentages, was as follows: Colorado, 25.51; Florida, 27.13; Iowa, 7.96; Kansas, 27.35; Massachusetts, 8.88; Michigan, 13.38; Minnesota, 43.17; Nebraska, 63.71; New Jersey, 12.98; Oregon, 11.11; Rhode Island, 10.03; Wisconsin, 18.84; Dakota, 207.19; District of Columbia, 14.54; New Mexico, 10.38.—Great complaint was made of the inaccuracy of the tenth C., particularly in its enumeration of the population, many cities and towns claiming (and in some instances, through a local census, proving) that the number of their inhabitants had been underestimated. The eleventh U. S. census was taken 1890; the twelfth, 1900.

CENT, *n. sent* [*L. centum*, a hundred, of which *cent* is an abbreviation: *It, cento*: *F. cent*]: a hundred; in the United States, a copper coin, in value the hundredth part

CENTAL—CENTAUREA.

of a dollar, equal to about a halfpenny sterling; they are legal tender to the amount of 25 cents. The Dutch cent is a copper coin, in value the hundredth part of a guilder. **PER CENT** [L. *per*, by, by means of]: by the hundred; a certain rate for each hundred of anything. **PERCENTAGE**, n. *-tāj*, so much for each hundred. **CENT PER CENT**, 100 by means of 100; \$100 for each \$100, as profit or interest; a sum of money yielding an equal sum as profit.

CENTAL, n. *sěn'tāl* [L. *centum*, a hundred]: the new imperial hundred weight, consisting of a hundred pounds.

CENTAUR, n. *sěn'taur* [L. *centau'rus*—from Gr. *ken-tau'ros*, a herdsman who fought on horseback—from Gr. *kentēō*, I spur; *tauros*, a bull]: a fabulous being said to have been half man and half horse (see **CENTAURS**); in *astron.*, a constellation, *Centaurus* (q.v.).

CENTAUREA n. *sěn'taro-rě'ă* [L. *centaurēum*, the centaury—from *centau'rus*, a Centaur—fabled to have cured the wound made by a poisoned arrow in the foot of the Centaur Chiron]: genus of plants of the nat. ord. *Compositæ*, sub-ord. *Cynaraceæ*, containing many species of annual and perennial herbaceous plants, natives chiefly of the temperate and cold regions of the e. hemisphere. Some species are common weeds, while some are frequent ornaments of flower-gardens.—The **BLUE-BOTTLE**, or **CORN BLUE-BOTTLE** (*C. cyanus*), is common in cornfields in parts of Europe and America, and indeed over the greater part of the world. It is an annual, growing to the height of about two ft., and producing its flowers in July and Aug. The florets of the disk are small and purple; those of the ray are few, comparatively large, and of a bright blue. Its flowers have long been much used in wreaths and garlands. It is common in gardens, with flowers variously modified by cultivation. Water distilled from the flowers of the blue-bottle was at one time in high repute as a remedy for weak eyes. The juice of the florets of the disk, with a little alum, dyes a beautiful and permanent blue.—The large blue-bottle (*C. montana*), native of central Europe, is still more frequently cultivated in flower-gardens. Its flowers are considerably larger, and it is a perennial.—**SWEET SULTAN** (*C. moschata*), native of the Levant, with fragrant flowers, also is common in flower-gardens. It is an annual or biennial.—Several species, having the involucre spiny, bear the name of **STAR-THISTLE**. The common **STAR-THISTLE** (*C. calcitrapa*) is a native of the s. parts of Europe. The Common or **BLACK KNAPWEED**,



Blue-bottle (*Centaurea cyanus*).

CENTAURS—CENTAURY.

called in Scotland *Horse Knot* (*C. nigra*), is abundant in the meadows and pastures of most parts of Britain, a troublesome perennial weed, difficult of extirpation. *C. Jacea*, also called Knapweed, is very common in parts of Europe, and its bitter astringent root, and indeed the whole plant, were formerly used in medicine. It affords a beautiful bright yellow dye, almost as good as saw-wort.

CENTAURS, *sĕn'tawrz* [see CENTAUR]: a wild race of men who inhabited, in early times, the forests and mountains of Thessaly, and whose chief occupation was bull-hunting. Homer, the first who mentions them, describes them merely as savage, gigantic, and covered with hair. They do not appear as monsters, half-man and half-horse, until the age of Pindar. The C. are celebrated in Greek



Centaur.—From the Elgin Marbles.

mythology on account of their war with the *Lapithæ* (q.v.), and their contest with Hercules. The fact lying at the bottom of Pindar's myth may refer to the impression which the old bull-hunters of Thessaly, who spent almost their whole life, it is said, on horseback, first made on some of the neighboring tribes—viz., that the man and the horse were one creature, which, it is recorded, was the opinion entertained by the Mexicans of the Spanish cavalry. On account of their resemblance to the Satyrs the C. were at a later period introduced into the artistic representations of the Bacchic worship.

CENTAURUS, *sĕn-taw'rus*, the *Centaur*: one of the constellations in the s. hemisphere, represented on the celestial globe by a form half-man and half-horse. The stars in this constellation are, according to Ptolemy's catalogue, 37 in number; according to the Britannic catalogue, 35. It contains the stars α Centauri and β Centauri, both of the first magnitude.

CENTAURY, n. *sĕn'taw-rĭ* [L. *centau'rus*: Gr. *ken-tau'ros*, a Centaur]: genus of plants, nat. ord. *Gentianeæ*, having a funnel-shaped regular 5-partite corolla. The spe-

CENTENARY—CENTENNIAL EXHIBITION.

cies are pretty little annuals, natives chiefly of the temperate parts of Europe and Asia, with pink or rose-colored flowers. They possess the tonic and other medicinal virtues of gentian, and though not frequently administered by physicians, are an important domestic medicine; and the tops are collected when the plant is in flower, by the country people for use in cases of dyspepsia, in intermittent fevers, and as a vermifuge. They contain a substance called *Centaurine*, the hydrochlorate of which is said to be an excellent febrifuge.—The common *C.* (*Erythraea Centaurium*) is the species most frequent in Britain; a plant of 8 inches to a foot in height, with flowers collected in loose heads, growing in dry pastures. Two or three other species are found on sandy sea-shores. Nearly allied to these is the AMERICAN *C.* (*Sabbatia angularis*), an annual plant with an erect quadrangular stem, extensively distributed throughout the United States and Canada, and much used in the domestic practice of America, as a prophylactic against autumnal fevers, in strong infusions and large and repeated doses. The name *C.* owes its origin to the same legend with the name *Centaurea*, although appropriated to plants of a different nat. order.

CENTENARY, *n.* *sĕn tĕ-nĕr-ĭ* [*L. centenāriŭs*, relating to a hundred—from *centum*, a hundred]: the number of a hundred; a hundredth anniversary. CEN'TENA'RIAN, *n.* a person a hundred years old. CENTEN'NIAL, *a.* *-tĕn'nĭ-ăl* [*L. centum*, a hundred; *annus*, a year]: pertaining to a hundred years; consisting of a hundred years; happening once in a century.

CENTENNIAL EXHIBITION: opened in Fairmount park, Philadelphia, 1876, May 10. An act of congress, 1871, Mar. 3, provided for the appointment by the pres. of the United States of two commissioners from each state to form a United States centennial commission; another, 1872, June 1, incorporated the centennial board of finance, and provided for the issue of stock to the amount of \$10,000,000 in shares of \$10 each. The board of directors was organized 1873, Apr. 1. Under Gen. Hawley as pres. of the commission, and Mr. John Welsh as pres. of the board of finance, and especially by the labors of the latter, the work of preparation was actively pushed. 236 acres were used and five buildings erected at a cost of \$4,500,000. The main building, intended to exhibit manufactures, mines, science, and education, covered 20 acres, was 1880 ft. long and 464 ft. wide, with wings respectively 416 and 216 ft. long. The roof was 70 ft. high, and was supported by trusses resting on 672 wrought-iron columns; there was an elevated square in the centre, and towers at the four corners. The space was thus apportioned to the different countries contributing: Argentine Republic, 2,861 sq. ft.; Austria-Hungary, 24,727; Belgium, 15,598; Brazil, 6,899; Canada, 24,118; Chili, 3,244; China, 6,628; France, 45,460; Germany, 29,629; Great Britain and Ireland, 54,155; India and British Colonies, 24,193; Hawaiian Islands, 1,575; Italy, 8,943; Japan, 17,831; Luxemburg, 247; Mexico,

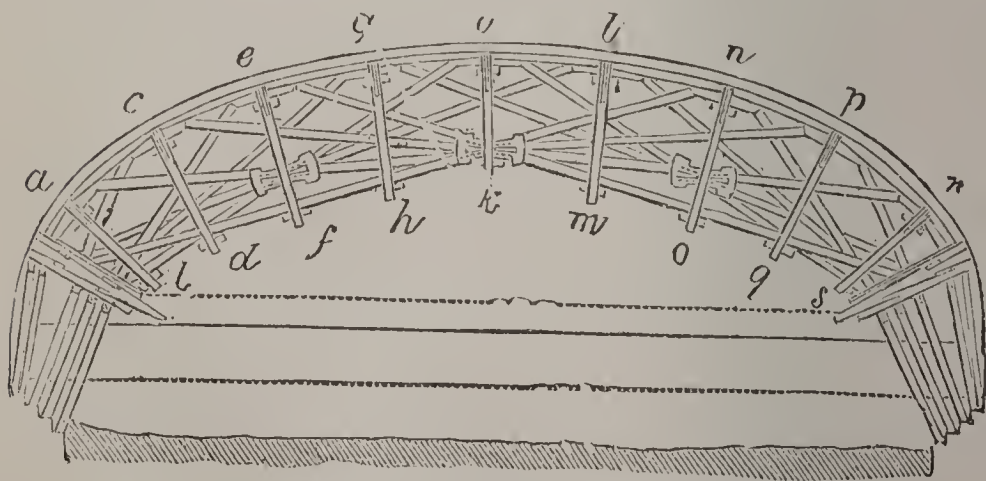
CENTENNIAL EXHIBITION.

6,567; Netherlands, 15,948; Norway, 6,959; Orange Free State, 1,058; Peru, 1,462; Spain and her colonies, 11,253; Sweden, 17,799; Switzerland, 6,693; Tunis, 2,015; Turkey, 3,347; United States, 136,684. The competition was sharp, and the exhibits most instructive. The Women's Pavilion covered an acre, represented some 15 nations, and was the first display of the kind ever attempted.—Machinery Hall, the second building in size, was 1,402 ft. long and 360 ft. wide, and, with its annex, covered nearly 13 acres. Steam, water-power, and shafting were furnished.—Agricultural Hall was 820 ft. by 540. Horticultural Hall was erected by the city in Moorish 12th c. style, of iron and glass, 383 ft. by 193, and 72 ft. high. This and the art building were designed to be permanent. The latter, called Memorial Hall, is in Renaissance style, 365 ft. by 210, and 59 ft. high, built of granite, glass, and iron, with a central tower 150 ft. high. The United States building, 504 ft. by 300, aimed to exhibit the various departments and functions of the public service.—Many pavilions, etc., were erected by foreign powers for their own use. Great Britain put up three, in Later Tudor style. France displayed models and charts of her public works, Sweden her school-houses, Spain her barracks, Canada her lumber, Turkey her sponge fisheries and cafés, Tunis her bazaars, Morocco her villas. 26 states of the union had buildings of their own, these as well as their contents being more or less representative. Private companies or individuals had 30 or more buildings for the display of their wares and operations—kindergarten, telegraph, banking, Bibles, transportation, etc. In the fall the number of buildings exceeded 200. The exhibition was continued for six months, till Nov. 10, being open on every day except Sundays, 7,250,620 visitors paid the admission fee of 50 cents, 753,654 paid 25 cents, and 1,906,692 were free; total number, 9,910,966. These represented every portion of the Union, besides foreign countries. The enterprise was well managed, and on the whole eminently creditable and successful; it had high educational value as a collection or encyclopedia of object-lessons, embracing every portion of the civilized world and nearly every article made or used by man.

CENTERING.

CENTERING, *n.* *sĕn'tĕr-ĭng* [see **CENTRE**]: the framework upon which an arch or vault of stone, brick, or iron is supported during its construction. The simplest form of **C.** is that used by masons and bricklayers for the arches of common windows and doors. This is merely a deal-board of the required shape, upon the curved edge of which the bricks or stones of the arch are supported until they are keyed in. In building bridges or other structures where arches of great span are to be constructed, the **C.** is made usually of framed timbers and iron combined. The arrangement of the timbers should be such, that the strain upon each shall be mainly a thrust in the direction of its length, for if the strain were transverse a comparatively slight force would snap it, and if a longitudinal pull the whole structure would be no stronger than the joints holding the pieces of timber together. In arches of great span, such as that of Waterloo bridge, London, a longitudinal pulling strain is almost inevitable in some parts, as a beam of great length would bend to some extent under a thrusting strain. In such cases great skill and care are demanded in the designing and construction of the joints. As an arch is built from the piers toward the keystone the weight upon the haunches during construction tends to push the crown upward, and therefore the problem of designing a frame **C.** involves the resistance of this tendency, as well as the supporting of the weight of the materials.

The annexed figure of the **C.** of Waterloo bridge, designed by Rennie, presents a fine example of the fulfilment of these requirements. It will be easily seen that a weight upon *np* and *ce* will be resisted by direct thrust upon the beams passing obliquely downward from these parts; one of each pair of these oblique beams thrusts outward, and is directly supported by the abutments; the other thrusts inward toward *k*, the yielding of which is prevented by the longitudinal pull of the lower and longer oblique beams *kq*, *kr*, *kd*, *ka*, etc. In this and other modern structures cast-iron shoes have been successfully used for the



Centring of Waterloo Bridge.

tying joints subject to the longitudinal pulling strain. The flexible **C.**, so called from its yielding at the joints,

and varying its form with the load put upon it, is now abandoned. It was used chiefly by French engineers. That of Perronet for the bridge of Neuilly is a celebrated example.

Occasionally, when a very great span is required, and the navigation will permit, piers are built, or piles are driven, to support the C., and the design is much simplified thereby.

Cupolas like the Pantheon and St. Peter's at Rome, St. Paul's in London, or the flat domes of the Turkish mosques, require very effective centerings.

CENTESIMAL, n. *sěn-tēs'ī-māl* [L. *centesimūs*, hundredth—from *centum*, a hundred]: the hundredth part; **ADJ.** hundredth. **CENTESIMALLY**, ad. *-lī*. **CENTESIMATE** v. *-māt*, to inflict the punishment of centesimation. **CENTESIMATION**, a mode of punishment for mutiny or wholesale desertion, in which every hundredth man was selected for punishment.

CENTE'TES: see **TENREC**.

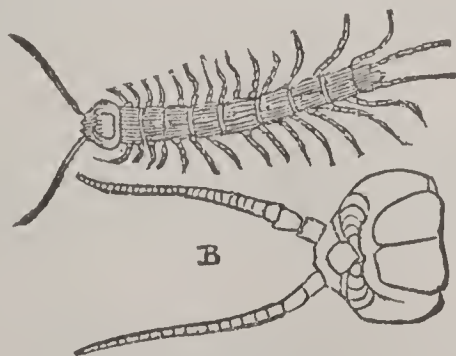
CENTIGRADE, n. *sěn'tī-grād* [L. *centum*, a hundred; *gradus*, a step]: a thermometer divided, between the freezing and boiling points of water, into 100 parts or degrees (see **THERMOMETER**). **CENTIGRAM**, n. *sěn'tī-grām* [Gr. *gramma*, a letter]: in *France*, the hundredth part of a gramme.

CENTILITRE, n. *sěn-tīl'ī-tēr*, or *sěn'tī-lī-tēr*, or *sōn'tī-lē-tr*, a measure of capacity or volume, being the hundredth part of a *litre*, or a little more than six-tenths of a cubic inch; spelled also **CENTILITER**.

CENTIME, n. *sěn-tēm'* [F.—from L. *centēsīmus*, hundredth—from *centum*, a hundred]: the hundredth part of the French franc.

CENTIMETRE, n. *sěn-tīm'ē-tēr*, or *sěn'tī-mē-tēr*, or *sōn'tī-mā'tr* [F.—from L. *centum*, a hundred; Gr. *metron*, a measure]: a French measure of length, equal to .394 in., or about 2-5ths in. English; spelled also **CENTIMETER**.

CENTIPEDE, or **CENTIPED**, n. *sěn-tī-pēd* [L. *centum* a hundred; *pedem*, a foot], (*Scolopendra*): genus of *Myriapoda*. (q.v.), having a long, slender depressed body, protected by coriaceous plates, 21 pair of legs, distinct eyes, four on each



Centipede:
B, head, magnified.

side, and antennæ with 17 joints. The name is, however, popularly extended to species of nearly allied genera. Cen-

tipedes run nimbly, feed on insects, and pursue them into their lurking-places. They have not only a pair of horny jaws, like those of insects, but also another pair of organs closely connected with the mouth, and which are regarded as transformed legs, dilated and united at the base, terminated by a strong hook, and pierced beneath the extremity for the emission of a venomous fluid, which makes their bite quickly fatal to insects, and in the case of the larger species, very painful and even dangerous to the larger animals and to man. The common C. of tropical America (*S. morsitans*) is often nine inches or a foot in length. A species found in the s. of Europe (*S. cingulata*) is nearly as large, but its bite does not seem equally venomous. It may seem strange that creatures of such aspect as centipedes should ever have been thought of as human food, but Humboldt, in his Personal Narrative, tells us that he has seen Indian children of the tribe of the Chuymas draw large centipedes out of the earth and eat them. An allied genus, *Geophilus*, of more numerous joints and slender form, contains some species which are occasionally phosphorescent, one of which, *G. longicornis*, yellow, with a rust-colored head, is very abundant at the roots of turnips, etc. It is supposed, however, to be rather useful than injurious, preying on the destructive larvæ of insects.

CENTLIVRE, *sěnt-liv'er* or *sěnt-lě'ver*, SUSANNA: abt. 1670–1723, Dec. 1; b. prob. in Ireland; dau. of a Lincolnshire gentleman named Freeman: English dramatic authoress. Her early history is obscure; but such were her wit and beauty that, on her arrival in London, though a destitute orphan, only 16 years of age, she won the heart of a nephew of Sir Stephen Fox, who, however, died shortly after their marriage. Her second husband, an officer named Carrol, lost his life in a duel. Left in extreme poverty, his widow endeavored to support herself by writing for the stage, and after producing a tragedy called *The Perjured Husband* (performed first in 1700), made her appearance on the stage. She afterward married (1706) Joseph Centlivre, principal cook to Queen Anne, with whom she lived happily until her death. Her plays—*The Busybody* (of which the leading character, 'Marplot,' is highly amusing), *A Bold Stroke for a Wife* (1717), and *The Wonder* (1714)—though not distinguished by purity of style or truthfulness of portraiture, are lively in their plots, and have kept their place on the stage.

CENTNER, n. *sěnt'ner* [Ger. *centner*, a hundred-weight—from L. *centenarius*, of or pertaining to a hundred]: a weight of a hundred pounds, used in some parts of England and Germany; the weight of a dram, divided into a hundred equal parts.

CENTO, *chěn'tō*: town of central Italy, 16 m. n.w. of Bologna, pleasantly situated on a fertile plain near the Reno. It is noted as the birthplace of the famous painter Guercino, whose house, adorned with paintings, is still preserved; and in the church of C. are many of his works. Pop. abt. 5,000.

CENTO, n. *sĕn'tō* [L. *cento*, a rag covering, a patchwork, Sp. and F. *centon*]: patch-work composition; name applied to literary trivialities in the form of poems manufactured by putting together distinct verses or passages of one author, or of several authors, so as to make a new meaning. After the decay of genuine poetry among the Greeks, this worthless verse-manufacture came into vogue, as is proved by the *Homero-centones*, a patchwork of lines taken from Homer (edited by Teucher at Leipsic, 1793); but it was much more common among the Romans in the later times of the empire, when Virgil was frequently abused in this fashion, as in the *C. Nuptialis* of Ausonius (who gives rules for the composition of the C.), and especially in the *C. Virgilianus*, constructed in the 4th c. by Proba Falconia, wife of the proconsul Adelfius, and giving, in Virgil's misplaced words, an epitome of sacred history! The C. was a favorite recreation in the middle ages. In the 12th c., a monk named Metellus contrived to make a C. of spiritual hymns out of Horace and Virgil.—See *Littérature du Centon*, by M. Delepierre (1875).

CENTRAL AMERICA: portion of N. America between the Isthmus of Tehuantepec and the Isthmus of Darien; including, with a small part of s. Mexico (Yucatan, etc.) Guatemala, British Honduras or Belize, Honduras, San Salvador, Nicaragua, Costa Rica, and a large part of Panama. In 1887, a diet held in Guatemala formulated a treaty of peace, friendship, and commerce designed to consolidate the five republics into a single federal union. In 1888 the govt. of Costa Rica issued a decree, based on Art. VI. of the diet's treaty, to the effect that citizens of all Central American republics would be considered citizens of Costa Rica when within her borders, and a second one providing for the meeting of a Central American congress at San José. By the treaty of Amapala, 1895, June 28, the republics of Honduras, Nicaragua, and Salvador were united under the title of the Greater Republic of Central America. This union was perfected by a new treaty signed 1898, Aug. 27, by which the name was changed to the United States of Central America. The achievement of the union was celebrated with elaborate proceedings at Amapala, 1898, Nov. 1, but on Nov. 30, the Federal organizers declared the union dissolved, the three States resuming their separate sovereignty. The collapse was due to the failure of the troops of Honduras, acting in behalf of the Federal organizers, to suppress an insurrection in Salvador against proposed federation, and to force Salvador into the Union. The area of Central America is about 175,000 sq. m.; the pop. 2,700,000.
2,626: (1890) 2,480; (1900) 3,114.

CENTRAL CITY: capital of Gilpin co., Colo., 40 m. w. by n. of Denver, on the Colo. Central railroad, at the e. base of the Snowy Range in the Rocky Mountains. It is a centre of gold mining; the Gregory lode, near by, was the first discovered in Colo. C. C. has several quartz-mills, three banks, six churches, an opera-house, two newspapers, and many good buildings. Pop. (1870) 2,360; (1880)

CENTRAL FORCES.

CENTRAL FORCES: those forces which cause a moving body to tend toward some point or centre, called the centre of force or motion. The doctrine of C. F. has for its starting point the first law of motion—viz., that a body not acted on by any external force will remain at rest, or move uniformly in a straight line. It follows from this law that if a body in motion changes either its velocity or its direction, some external force is acting upon it. The doctrine of C. F. considers the paths which bodies will describe round centres of force, and the varying velocity with which they will pass along in these paths. It investigates the law of the force round which a body describes a known curve, and solves the inverse problem, and many others, the general statement of which could convey no clear idea to the unmathematical reader. As gravity is a force which acts on all bodies from the earth's centre, it affords the simplest, general-illustration of the action of a central force. If a stone be slung from a string, gravity deflects it from the linear path which it would otherwise pursue, and makes it describe a curved line which we know would, in vacuo, be a parabola. Again, the moon is held in her orbit round the earth by the action of gravity, which is constantly preventing her from going off in the line of the tangent to her path at any instant, which she would do, according to the first law of motion, if not deflected therefrom by any external force. To that property of matter by which it maintains its state of rest or motion, unless acted upon by other matter, has been given the name *inertia*.

To show how, through the action of a central force, a body is made to describe a curved path, suppose it to have moved for a finite time, and conceive the time divided into very small equal parts; and instead of the central force acting constantly conceive a series of sudden impulses to be given to the body in the direction of the centre, at the end of each of the equal intervals, and then observe what, on these suppositions, will happen. Let S (see fig. 1) be the centre, and let the original motion be from A, on the line AB, which does not pass through S. In the first interval, the body will move with a uniform velocity, say from A to B. In the second, if acted on by no force, it would

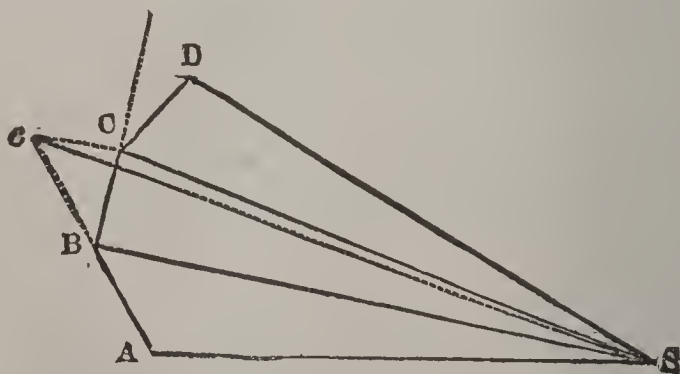


Fig. 1.

move on in AB produced to *c*, Bc being = AB. But when it arrives at B, it receives the first sudden impulse toward

S. By the composition of velocities (q.v.) it will move now with a new but still uniform velocity in BC instead of Bc, BC being the diagonal of the parallelogram of which the sides represent its impressed and original velocity. Having reached C at the end of the second interval, it receives the second impulse toward S. It will now move in CD instead of in BC produced. If, then, we suppose the periods of time to be indefinitely diminished in length, and increased in number, the broken line ABCD will become ultimately a continuous curve and the series of impulses a continuous force. This completes the explanation.

Going back, however, on our suppositions, we may here establish Newton's leading law of central forces. That the body must always move in the same plane results from the absence of any force to remove it from the plane in which at any time it may be moving. The triangles ASB and BSC are clearly in the same plane, as the latter is on that in which lie the lines Bc and BS. Also, since the triangles ASB, BSc are equal, being on equal bases, AB, Bc, and $\triangle BSC = \triangle BSc$, as they are between the same parallels, cC and BS, it follows (by Euclid I. 37) that $ASB = BSC$. So $BSC = CSD$; and so on. In other words, the areas, described in equal times by the line (called the radius vector) joining the centre of force and the body, are equal. As this is true in the limit, we arrive by the composition of the small equal areas, at the law: that the areas described by the lines drawn from the moving body to the fixed centre of force, are all in one plane, and proportional to the times of describing them. Very few of the laws of C. F. are capable of being proved like the preceding, without drawing largely on Newton's lemmas, with which the average reader is not acquainted.

Centrifugal and Centripetal Force.—We have shown that a body continually drawn to a centre, if it has an original motion in a line that does not pass through the centre, will describe a curve. At each point in the curve, it tends through its inertia, to recede from the curve, and proceed in the tangent to it at that point. It always *tends* to move in a straight line in the direction in which it may at any

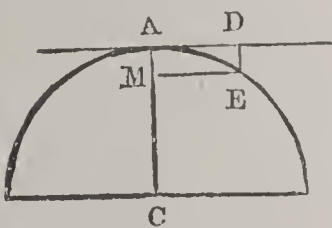


Fig 2.

time be moving, and that line, by the definitions of a tangent and of curvature, is the tangent to the curve at the point. At the point A (see fig. 2), it will endeavor to proceed in AD; if nothing hindered it, it would actually proceed in that line, so as, in the time in which it describes the arc of the curve AE, to reach the point D, and thus recede the length DE from the curve; but being continually drawn out of its direction into a curve by a force to a centre, it falls below the point D by the distance DE. The force which draws it through this distance is called the centripetal force, and that which would make it recede in the same time through the distance DE from the curve is called the centrifugal force. It is to be noted that the centrifugal force is not, like the centripetal, an impressed or external force

CENTRAL HEAT—CENTRALIZATION.

acting on the body: it is simply the assertion of the body's inertia under the circumstances produced by the centripetal force.

Illustrations are numerous and familiar of the action of the centrifugal force. A ball fastened to the end of a string, and whirled round, will, if the motion is made sufficiently rapid, at last break the string, and fly off. A glass of water may be whirled so rapidly that, even when the mouth is presented downward, the water will still be retained in it, by the centrifugal force pressing it up against the bottom of the glass. The centrifugal action will be found to increase with the velocity. In all cases of a body moving in a circle, the force, it can be proved, varies as the square of the velocity of the body at the moment, and in the inverse ratio of the radius. As in this case the velocity varies as the radius inversely, it follows that the force is as the inverse cube of the radius. As in the case of circular motion the body always is at the same distance from the centre, it follows that the centrifugal and centripetal forces are equal at all points of a circular orbit. The general law for all orbits is, that the centrifugal force varies as the inverse cube of the distance from the centre. As the attractive force of gravitation varies as the inverse square of the distance it may hence be shown that the centrifugal force gives perfect security, notwithstanding the constant attraction of the sun, that the planets, so far as that attraction is concerned, will never fall into the sun.

The doctrine of C. F. owes more to Kepler and Sir Isaac Newton, of whose philosophy it makes a considerable branch, than to all the rest of the philosophers, though almost all the leading mathematicians have contributed to it. The doctrine of centrifugal forces was first mentioned by Huygens, at the end of his *Horologium Oscillatorium*, 1673; but Newton was the first who fully handled the doctrine, at least so far as regards the conic sections.

CENTRAL HEAT: see EARTH.

CENTRALIA, *sĕn-trā'lya*: city of Marion co., Ill., 66 m.e. of St. Louis, 113 n. of Cairo, and 252 s. of Chicago; on the Ill. Central R.R., at the junction of its main line and the Chicago division. Here are the railroad machine shops, the Southern Ill. fair grounds, a coal mine, an iron foundry, several factories, a bank, two newspapers, a library, seven churches, a high school, and several parks. Pop. (1880) 3,621; (1900) 6,721; township abt. 400 more.

CENTRAL INDIA: a group of States in India, divided into nine political agencies, but feudatory to Great Britain through an agent of the gov. gen. The chief of them are Gwallor or Scindiah, Indor or Holkar, Rewah, and Bhopál. The group is bounded on the n. by Rájputáná, the N. W. Provinces, and Oudh; e. by the Chhotá Nágpur division of Bengal, s. by the Central Provinces, and w. by Bombay. Estimated area, 78,772 sq. m. Pop. (1901) 8,628,781.

CENTRALIZATION, *sĕn-tral-iz-a'shŭn*: in *politics*, a tendency to administer, by the sovereign or the central

government, matters which had been previously under local management. We cannot properly use the term in relation to an established despotism, for there everything is already directed from the centre. The legitimate application is to a state of change from local to central management—a change in the opposite direction would, on the same principle, be called localization. Of this latter change, however, there are scarcely any recent examples, unless in the systems of self-government lately communicated to some of the British colonies. Ever since the existing European states began to rise from the chaos of the fall of the Roman empire, there has been a continued progress in centralization. That empire itself developed the first stages of C. over a vaster extent than the world had known before. The empire, such as it had become in the days of Constantine, was the type after which the European monarchs, such of them especially as became more powerful than their neighbors, were ever striving; and a few of them, such as Charlemagne, and, long afterward, Charles V., seemed to have almost restored it. In Great Britain, C. may be traced from the time when there were about a dozen kings in Britain, and perhaps as many in Ireland, till the united kingdom came under the rule of one monarch. A subsidiary C. at the same time made silent progress, absorbing the feudal power of the aristocracy and the municipal privileges of the corporations. In other countries—as, for instance, in France, notwithstanding her desperate struggles for freedom, this process of C. has tended to a pure irresponsible despotism. With so sad a result before their eyes, a distrust of C. has not unnaturally been felt by some inhabitants of Great Britain. But the British constitution possesses a grand remedy which turns the process to good use instead of mischief. While administrative authority has been centralizing in the crown, the controlling power of parliament has been increasing at a more rapid ratio, so that the vesting of a function in the crown or central government, means the putting it under the control of parliament, and especially of the people's representatives in the house of commons. There is nothing done in any of the offices under the government for which a secretary of state, or some other member of the ministry, may not at any time be called to account in parliament. The efficiency of this control was in a manner proved by one or two instances in which offices with central powers were created, without being connected with any of the great state departments. There were, for instance the English poor-law board, and the board of health. Both created much discontent and outcry about C., and it was found necessary to transfer their functions to the great government departments, the heads of which are immediately responsible to parliament. It is not the policy of Great Britain in any case to abolish local management, but rather to aid and direct it from the central authority. The constituents of local bodies are often disinclined to watch or control them and the business falls into the hands of incapable or designing men, or is other-

CENTRAL PARK—CENTRE OF GRAVITY.

wise mismanaged. A very little central help—especially from a quarter where the proceedings of other bodies of the same kind are known—remedies such defects. One of the methods in which the government has of late been in use to exercise its central power, has been by the appointment of inspectors, who make reports which are laid before parliament. This is, in reality, nothing more than a method of concentrating public opinion on the proceedings inspected and reported on, and as such it is very efficacious.

In the United States a fear of increasing C. is sometimes expressed; but—except that the result of the war of secession was to confirm the sovereignty of the general government in those departments of common concern in which its sovereignty had been expressly established by the constitution—no evidence is presented of any process of C. tending to the withdrawal of any merely local interests from the sphere of the appropriate local government.

CENTRAL PARK: see NEW YORK.

CENTRAL PROVINCES OF INDIA: see INDIA, British.

CENTRE, or CENTER, n. *sĕn'tĕr* [F. *centre*—from L. *centrum*, the middle point; Gr. *kentron*, a sharp point]: the middle point or place. V. to place on the middle point; to collect to one point; to settle exclusively on one object; to rest on. CEN'TRING, imp. *-trĭng*, or CEN'TERING, imp. *-tĕr-ĭng*. CEN'TRED or CEN'TERED, pp. *-tĕrd*. CEN'TRAL, a. *-trāl*, placed at or near the middle. CEN'TRALLY, ad. *-lĭ*. CEN'TRALIZE, v. *-ĭz*, to draw or bring to a centre. CEN'TRALIZING, imp. CEN'TRALIZED, pp. *-ĭzd*. CEN'TRALIZATION, n. *-zā'shŭn*. CENTRALISM, n. *-ĭzm*, the combination of several parts into one whole. CENTRALITY, n. *-ĭ-tĭ*, state of being central. CENTRE-BIT, n. *-tĕr-bĭt*, an instrument with a projecting conical point, working on an axis, for boring circular holes. CENTRE OF GRAVITY, that point of a body which, being supported, the whole body will remain at rest, even though acted upon by gravity. CENTRE OF MOTION, the point in a body which remains at rest, while all the other parts move round it. CEN'TRICAL, a. *-trĭ-kāl*, and CEN'TRIC, a. *-trĭk*, placed in or near the centre or middle. CEN'TRICALLY, ad. *-lĭ*. CEN'TRICALNESS, n.

CEN'TRE OF GRAVITY: that point in a body or system of bodies rigidly connected, upon which the body or system acted upon only by the force of gravity, will balance itself in all positions. Though the action of gravity enters this definition, many of the properties of the point are independent of that force, and might be enunciated and proved without conceiving it to exist. By some, accordingly, the point has been called the *centre of magnitude*, and by others, the *centre of parallel forces*. Such a point exists in every body and system, and only one such point. Every body may be supposed to be made up of a multitude of minute particles connected by cohesion, and so far as its balance under gravity is concerned, each of these may be supposed to be removed, and its place occupied by a force proportioned to its weight. Instead of the body, on these

CENTRE OF GRAVITY.

suppositions, we should then have a system of parallel forces, the lines from the various particles to the earth's centre being regarded as parallel. But a system of parallel forces (see PARALLEL FORCES) has a single resultant acting through a fixed point, whose position is independent of the position in space of the points of application of the component forces, provided their relative positions in the system continue unchanged. This point is the C. of G.; and if it be supported, it is clear that the body will balance itself upon it in all positions. The same reasoning obviously applies to any system of bodies rigidly connected. It is usual to demonstrate this and the general rule for finding the C. of G. by proving it first in the case of two heavy particles forming a body or system, and then extending the proof to the case of any number of particles. Let P and Q (see fig. 1) be two heavy particles. Join P and Q, and divide the line PQ in C, so that weight of P : weight of Q :: CQ : CP. Then C will be the C. of G. of P and Q. Draw ACB horizontal, and PM, QN vertical, meeting AB in M and N. Then if P and Q represent the weights of P and Q, we have $P : Q :: CQ : CP$. But $CQ : CP :: CN : CM$ by similar triangles. Therefore $P : Q :: CN : CM$, and $P.CM = Q.CN$. P and Q,

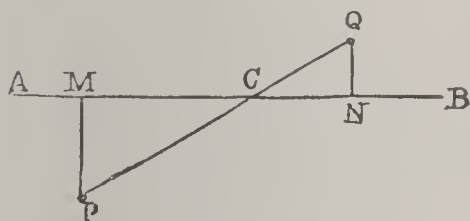


Fig. 1.

therefore, are balanced about C. See BALANCE and LEVER. This is true in all positions of P and Q, for no assumption was made as to their positions. C, therefore, is their centre of gravity. Also, we may conceive P and Q to be removed (see PARALLEL FORCES), and in their stead a particle at C equal to them taken together in weight. If, now, the system contained three, it is clear how we should proceed to find its centre of gravity; having found the C. of G. of two, we should consider the system as formed of two—viz., the equivalent of the first two at their C. of G., and the third, when the case would fall under that already treated; and so on, extending the rule to a system containing any number of particles. Apart from this rule, however, it is possible, in the case of most regular homogeneous bodies, to fix upon their centres of gravity from general considerations. The C. of G. of a straight line, for instance, must clearly be in its middle point. So the C. of G. of a uniform homogeneous cylinder must be in the middle point of its axis. It must be in the axis, for the cylinder clearly is equally balanced about its axis. It must also be somewhere in its middle circular section, for it will balance itself on a knife-edge under that section. It must, therefore, be in the point where that section cuts the axis, or in the middle of the axis. The C. of G. of a uniform material plane triangle may be found from similar considerations. The triangle ABC (see fig. 2) may be supposed to be made up of uniform material lines parallel to its base AB; each of these will balance upon its middle point. The whole triangle,

CENTRE OF MAGNITUDE.

therefore, will balance upon the line CD, which bisects the base AB and all lines parallel to it. In the same way the triangle will balance upon the line AE, bisecting BC. But if a figure balances itself upon a line, its C. of G. must lie in that line. The C. of G. of the triangle is therefore in

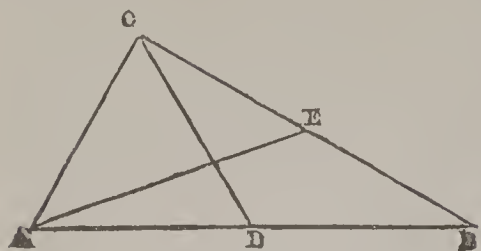


Fig. 2.

CD, and also in CB. It must therefore be at g where these lines intersect, g being the only point they have in common. Now, by geometry, we know that g divides CD, so that $Cg = \frac{2}{3} CD$. Hence the rule for finding the C. of G. of a triangle: Draw a line from the vertex, bisecting the base, and measure off Cg , two-thirds of the line. g is the centre of gravity. By a similar method, the C. of G. of a great number of figures may be determined.

The above method applies only where the figure of the body is regular, and its mass homogeneous. But many bodies, besides being irregular, are formed by the agglomeration of particles of different specific gravities. Of these the C. of G. can be found only by experiment, though not always satisfactorily. Let the body be suspended by a string and allowed to find its position of equilibrium. The equilibrium being due to the tension of the string counterbalancing gravity, it follows that the tension is in the same line with that on which gravity acts on the body. But the tension acts on the line of the string, which therefore passes through the centre of gravity. Mark its direction through the body. Suspending it, then, by another point, we should ascertain a second line in which lies the centre of gravity. The C. of G., then, must be where these lines intersect.—For the effect on the stability of bodies of the position of the C. of G., see STABILITY.

CEN'TRE OF GYRA'TION: point at which, if the whole mass of a body rotating round an axis or point of suspension were collected, a given force applied would produce the same angular velocity as it would if applied at the same point to the body itself. The C. of G. bears a strong analogy to the centre of oscillation. The cases differ only in this, that in the latter the operating forces are supposed to act at every point of the moving body, while in the former there is only one force acting upon one point. The C. of G. is found by the following rule: Divide the moment of inertia of the rotating mass by the mass of the body, and extract the square root of the quotient. The result is the distance of the point from the axis of rotation. The moment of inertia, it may be stated, is the sum of the products of the weight of each point of the mass by the square of the perpendicular distance of that point from the axis.

CEN'TRE OF MAG'NITUDE, or CENTRE FIGURE (see **CENTRE OF GRAVITY**): the point on which plane figures

CENTRE OF OSCILLATION.

and curved surfaces would balance themselves, supposing their areas to have weight. Thus, the centre of a circle is its centre of magnitude. Otherwise, C. of M. or C. F. is a point so situated that all straight lines passing through it and terminated by the circumference or superficies of the figure or surface are bisected in it.

CENTRE OF OSCILLATION: the point in an oscillating body which is occupied by the particle in which the accelerating and retarding effects of the other particles are mutually neutralized: see PENDULUM, where it is shown that the time of a pendulum's vibration increases with its length, being always proportioned to the square root of its length. This is strictly true only of the simple pendulum, in which the pendulous body is supposed to have no determinate magnitude, and to be connected with the point of suspension by an inflexible wire without weight. If, however, the vibrating body have a determinate magnitude, then the time of the vibration will vary, not with the square root of its length, but with the square root of the distance from the axis of suspension of a point in the body called its centre of oscillation.

If each part of the vibrating body were separately connected with the axis of suspension by a fine thread, and entirely disconnected from the rest of the body, it would form an independent simple pendulum, and oscillate as such—the time of each vibration being as the square root of the length of its thread. It follows that those particles of the body which are nearest to the axis of suspension would, as simple pendulums, vibrate more rapidly than those more remote. Being connected, however, as parts of the solid body they vibrate all in the same time. But this connection does not affect their *tendencies* to vibrate as simple pendulums, and the motion of the body which they compose is a compromise of these tendencies of its particles. Those nearest the axis are retarded by the more remote, while the more remote are urged on by the nearer. Among these particles there is always one to be found in which the accelerating and retarding effects of the rest are mutually neutralized and which vibrates in the same time as it would if it were unconnected with the other parts of the body, and simply connected by a fine thread to the axis of suspension. The point in the body occupied by this particle is its centre of oscillation. By this C. of O. the calculations respecting the vibration of a solid body are rendered as simple as those of a molecule of inconsiderable magnitude. All the properties which belong to a simple pendulum may be transferred to a vibrating body of any magnitude and figure, by considering it as equivalent to a single particle of matter vibrating at its centre of oscillation.

The determination of the position of the C. of O. of a body usually requires the aid of the calculus. It is always further from the axis of suspension than the centre of gravity is, and always in the line joining the centre of gravity and the point of suspension, when the body is suspended from a point. The rule for finding it in such a

CENTRE OF PRESSURE.

case is: If S be the point of suspension, and O the C. of G.,
 $SO = \frac{\sum(m\bar{d}^2)}{M.Sg}$; or it is the quotient obtained by dividing the moment of inertia of the body by the product of its mass into the distance of its centre of gravity from the point of suspension.

CEN'TRE OF PERCUS'SION, in a body or a system of bodies revolving about a point or axis: that point which striking an immovable object the whole mass shall not incline to either side, but rest, as it were, in equilibrio, without acting on the centre or axis of suspension. But if the body be moving freely then the C. of P. is that point in it at which its whole impetus is supposed to be concentrated. In this case, if the body struck with its C. of P. an immovable obstacle, and if it were perfectly rigid and inelastic, it would come to perfect repose; whereas, if it struck the obstacle with any other point a rotatory motion would be produced in it. When the body is moving freely and there is no rotatory motion, the C. of P. coincides with the centre of gravity. If the body be moving round a point or axis of suspension, the C. of P. coincides with the centre of oscillation. The more complicated case of a body rotating round an axis within it would require, for its explanation, analytical formulæ which cannot conveniently be translated into ordinary language. There are many positions which the axis may have in which there will be no C. of P.—i.e., there will be no direction in which an impulse could be applied without producing a shock upon the axis. One case of this sort is that of the axis being a principal axis through the centre of gravity.

CEN'TRE OF PRES'SURE, of any surface immersed in a fluid: the point in which the resultant of the pressures of the fluid on the several points meets the surface. When the bottom of a vessel containing fluid, or when a plane immersed in fluid, is horizontal, the pressure on every point of it is the same, being that due to the weight of the column of fluid standing above the bottom or plane. In either case the pressures at the different points obviously form a system of equal parallel forces, whose centre will be the centre of gravity of the bottom or plane, their resultant passing through this point being the sum of all their forces. But when the plane is inclined at any angle to the surface of the fluid, the pressure is not the same at all points, but is obviously greater at the lower than at the upper points, for the lower have to support taller columns of the fluid. The resultant of these forces, then, will not pass through the centre of gravity of the surface, but through a point below it. This point is the C. of P., and evidently will lie below the centre of gravity for all fluids in which the pressure increases with the depth. If the surface pressed upon form part of the containing vessel, and be supposed movable, it will be kept at rest by a pressure equal to the sum of the fluid pressures applied at the C. of P. and acting in the opposite direction. In the case of a vessel with a parallelogram for one side, the C. of P.

CENTRIFUGAL—CENTURION.

is at the distance of one-third of the height from the bottom. In the case of a triangular vessel whose base is at the bottom, it is one-fourth of the height only.

CENTRIFUGAL, n. *sěn-trĩf'ũ-gāl* [L. *centrum*, the centre; *fugĩō*, I flee]: tending to fly or go off from the centre (see **CENTRAL FORCES**): in *bot.*, applied to that kind of inflorescence in plants in which the central flower opens first. **CENTRIPETAL**, a. *-trĩp'ě-tāl* [L. *pěto*, I seek, I move to a place]: tending to the centre; having a desire to move to the centre (see **CENTRAL FORCES**): in *bot.*, applied to that kind of inflorescence in plants in which the flowers expand from below upward, or from the circumference inward. **CENTRIFUGAL FORCE**, the force by which bodies, when set in motion round a centre, have a tendency to fly off at a tangent from the circle round which they move. **CENTRIPETAL FORCE**, the force which drives or impels a body toward some point as a centre; the force or gravity by which bodies tend to a point or centre.

CENTRIFUGAL AND CENTRIPETAL, *sěn-trĩf'ũ-gāl, sěn-trĩp'e-tal*, in Botany: two different kinds of inflorescence, or modes of flowering of plants. When the flower-bud which terminates the floral axis, and is central in the inflorescence, is the first to expand—in which case the others are developed in succession from the centre outward—the inflorescence is said to be *centrifugal*. When the outermost flowers expand first, the inflorescence is *centripetal*, as is the case in catkins, spikes, and racemes, in which the flowers nearest the base are the first to expand, and those nearest the apex the last. These modes of inflorescence are very characteristic of different plants, of genera, and of orders.

CENTRING: see **CENTERING**.

CENTROIDS, n. plu. *sěn'troyds* [L. *centrum*, the middle point: Gr. *eidos*, resemblance]: the generating curves of such geometrical figures as cycloids and epicycloids.

CENTRUM, n. *sěn'trũm* [L. *centrum*, the centre]: in *anat.*, the body of a vertebra.

CENTUMVIRI, *sěn-tũm'vĩ-rĩ*: judges of ancient Rome, three from each tribe, who determined ordinary causes. The extent of their jurisdiction is uncertain. Hollweg (*Ueber die Competenz des Centumviralgerichts*) would confine it to civil cases: it seems probable that they at first handled questions relating to quiritian ownership, which determined the status of the citizens.

CENTUPLE, n. *sěn'tũ-pl* [F. *centuple*—from L. *centũ-plus*, augmented a hundred-fold—from *centum*, a hundred; *plĩco*, I fold]: a hundred-fold: V. to multiply a hundred-fold. **CENTUPLICATE**, v. *-tũ'plĩ-kāt*, to make a hundred-fold. **CENTUPLICATING**, imp. **CENTUPLICATED**, pp.

CENTURION, n. *sěn-tũ'rĩ-õn* [F. *centurion*—from L. *centũrĩõnem*—from *centum*, a hundred]: among the *anc. Romans*, a captain of infantry at first commanding 100 men,

CENTURY—CEPHALO-BRANCHIATE.

but later a number indefinite. These officers were chosen by the tribunes.

CENTURY, n. *sĕn'tū-rĭ* [F. *centurie*, a group of a hundred—from L. *centŭriā*, a century—from *centum*, a hundred]: a group or period of a hundred years. **CENTU'RIAL**, a. *-rĭ-āl*, pertaining to a century.

CENTURY PLANT: see **AGAVE**.

CEPHAËL'IS: see **IPECACUANHA**.

CEPHALASPIS, n. *sĕf'ă-lăs-pĭs'* **CEPHALASPIDÆ**, n. plu. *sĕf'ă-lăs'pĭ-dē*: [Gr. *kephālĕ*, the head; *aspis*, a shield], genus of fossil ganoid fishes, of which six species have been described, two belonging to the Upper Silurian, and four to the Devonian measures. The head was protected by a large ganoid plate, sculptured externally with circular radiating markings. Agassiz gave the name C. (buckler-headed) from this extraordinary covering, which has very much the appearance of, and was formerly supposed to be, the cephalic shield of an *Asaphus*. The body was covered with rhomboidal enamelled scales, and furnished with dorsal and pectoral fins; it terminated in a large heterocercal tail. In a graphic description of this fossil in his *Old Red Sandstone*, Miller thus sketches the general appearance of the animal: 'Has the reader ever seen a saddler's cutting-knife—a tool with a crescent-shaped blade, and the handle fixed transversely in the centre of its concave side? In general outline, the C. resembled this tool; the crescent-shaped blade representing the head, the transverse handle the body.' The endo-skeleton was cartilaginous, retaining the notochord through life. The flexible body, assisted by the large tail and the fins, would give the C. the power of moving rapidly through the water. Being a predaceous fish it must have been a formidable enemy to its associates in the Palæozoic seas, for, besides its power of rapid motion, the sharp margin of its shield probably did the work of a vigorously-hurled javelin, as in the sword-fish. This genus was originally named *Asterolepis* (star-scale), from the circular markings on its cephalic shield.

CEPHALATE, n : a mollusk having a head.

CEPHALIC, a. *sĕ-făl'ĭk* [Gr. *keph'ālĕ*, the head]: pertaining to the head: N. a medicine for headache. **CEPHALINE**, n. *-sĕf'ă-lĭn*, a knitted woolen band passing round the head and over the ears, as a preservation against cold, worn by ladies. **CEPHALALGIA**, n. *sĕf'ă-lăl'jĭ-ă*, or **CEPH'ALAL'GY**, n. *-jĭ* [Gr. *algos*, pain]: pain in the head; headache. **CEPH'ALAL'GIC**, a. *-jĭk*, pertaining to.

CEPHALIZATION, *sĕf-al-ĭ-ză'shŭn*: proportion of the brain to the rest of the animal structure—varying in different animals, most predominant in man: see **BRAIN**: **CEREBRUM** AND **CEREBELLUM**.

CEPHALO-BRANCHIATE, a. *sĕf'ă-lō-brăng'kĭ-ăt* [Gr. *keph'ālĕ*, the head; *brangchĭă*, a gill]: carrying gills upon the head, as certain of the Annelida. **CEPHALOID**, a.

CEPHALO-EXTRACTOR—CEPHALOPHORA.

sěf'ăl-oyd [Gr. *eidōs*, resemblance]: in *bot.*, capitate or head-shaped.

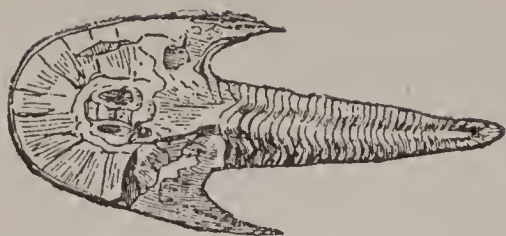
CEPHALODINE, a. *sěf'ăl'ō-dīn* [Gr. *keph'ālē*, the head; *eidōs*, resemblance]: in *bot.*, forming a head.

CEPHALO-EXTRACTOR, n.: an instrument to extract the fetus by the head.

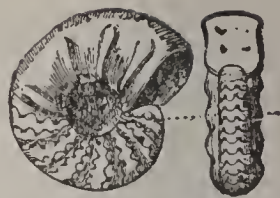
CEPHALONIA, or CEFALONIA, *sěf-a-lō'nī-ā*, or *chěf-a-lō'ne-ā*: largest of the seven Ionian Islands (q.v.); at the entrance of the Gulf of Lepanto or Corinth, lat. 38° 3'—38° 30' n., and long. 20° 21'—20° 49' e. It is irregular in shape; greatest length about 30 m.; area 302 sq. m. Its surface is mountainous, the soil, for the most part, thin, and water very scarce. The inhabitants, however, are industrious and enterprising, and have planted vineyards wherever the grape will grow, and currants and olive-oil are also produced for export. The climate is warm and agreeable. The exports have an annual value of about \$1,000,000, and the imports of about \$1,250,000. The number of persons brought up to the medical profession is remarkable; it is said that there is hardly a town in the Levant which has not a practitioner from Cephalonia. The inhabitants are also much more energetic in foreign trade than those of Corfu or Zante. The island is subject to frequent but slight earthquakes. There was formerly a small English garrison at Cephalonia. Steamers ply between it and Malta, Patras, and Triest. The language spoken is a Greek dialect. The chief towns are Argostoli (q.v.) and Lixuri.

C. is called by Homer Same or Samos, and during the heroic ages was subject to Ulysses, whose residence was in the neighboring isle of Ithaca (q.v.). Later, C. appears under the name of Cephallenia. It successively fell into the hands of the Athenians, Romans, Byzantines, and Venetians, from the last of whom it was several times wrested by the Turks. On the ruin of the Venetian republic, 1797, it was seized by the French, who were in their turn dislodged by the Russians. In 1809, it came into the possession of England. It was ceded to Greece 1864. Pop. (1879) 80,543; (1889) 80,178.

CEPHALOPHORA, n. plu. *sěf'ăl-ōf'ō-rā* [Gr. *keph'ālē*, the head; *phorēō*, I bear, I carry]: a name for those mollusca which have a distinct head—more usual term is 'encephala.'



Cephalaspis Lyellii.



Ceratites podosus.



Cerberus.—Antique bronze.



Ceres.—Antique statue in the Louvre.



Upper Jaw of Port-Jackson Shark
(*Cestracion Philippi*).

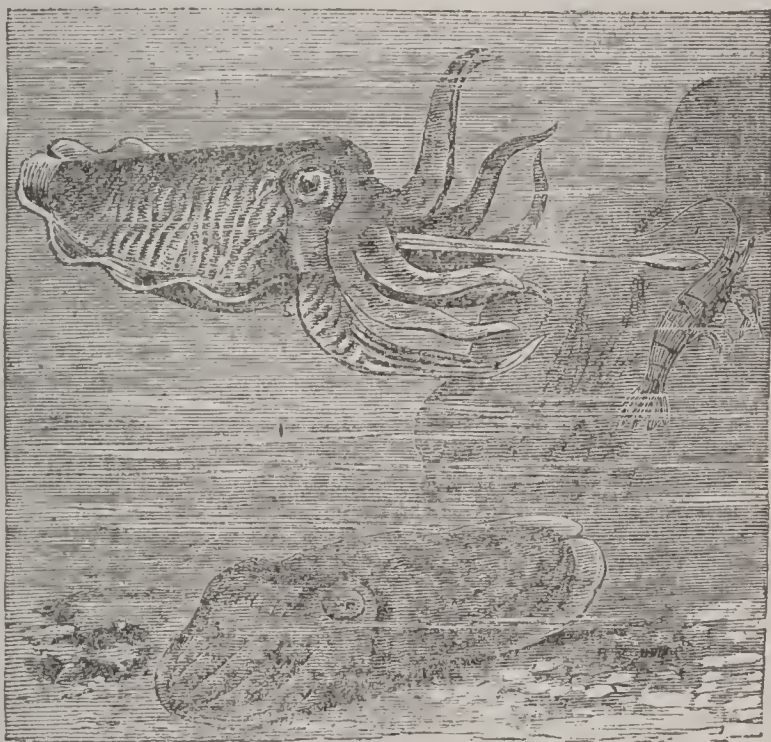


Cestracion.—Outside view of Egg
case of *Cestracion Philippi*.

CEPHALOPODA.

CEPHALOPODA, n. plu. *sěf'ăl-öp'-ōdă*, or **CEPHALOPODS**, n. plu. *sěf'ăl-ō-pōdz* [Gr. *keph'ălē*, the head; *podēs*, feet]: class of mollusks, highest in organization of that division of the animal kingdom. To this class belong the nautili, spirulæ, argonauts, poulpes, squids or calamaries, cuttle-fish, etc., of the present time, and the ammonites, belemnites, etc., of former geological periods. The C. all are marine, and only a few are capable of leaving the water, and moving about in search of food on the shore. **CEPHALOPODOUS**, a. *sěf'ăl-öp'ō-dūs*, pertaining to those animals which have the feet or arms arranged around the head, or the head between the body and the feet.

The C. receive their name from having organs of prehension and locomotion attached to the head, an arrangement toward which a gradual approach may be traced in the highest gasteropod (q. v.) mollusks. The organs have been variously designated *arms*, *feet*, and *tentacula*. They 'have no true homology' with the limbs of vertebrate animals, but are analogous to them in respect only of the purposes which they serve. The body of the C. is a bag, formed of the *mantle* (see **MOLLUSCA**), open only at the end to which the head is attached. In some, this bag is almost spherical, and locomotion is accomplished only by the appendages of the head; in others, the body is elongated, and furnished with two fin-like expansions, which are the



Cuttle-fish (*Sepia officinalis*): swimming and at rest.
From specimens at the Crystal Palace Aquarium.

principal instruments of locomotion. In locomotion by the fins a cephalopod swims like a fish, with the head first, and often very rapidly; in locomotion by the arms it drags itself along, laying hold of any object within reach by means of suckers, with which the arms are furnished.

CEPHALOPODA.

Some C. are capable also of moving backward through the water by alternate contractions and expansions of a muscular web which unites the bases of the arms; some appear to depend for a similar power of swimming backward upon the forcible ejection of water from the 'funnel' below the eyes.

The head of a cephalopod is roundish, generally furnished with two large and prominent eyes, very similar in structure to those of vertebrate animals. There are also ears, but they consist merely of little cavities, one on each side of the brain, in each of which is suspended a membranous sac containing a small stone. The organs of smell are not very certainly known, but it appears that the C. possess this sense, as well as that of taste, of which the character of the tongue is much more indicative than in many vertebrate animals.—The brain forms a ring around the gullet. The whole nervous system is more complex than in the lower mollusks.—The mouth opens in the midst of the circle of arms. It is furnished with a strong, horny beak of two mandibles, moving vertically, not unlike the bill of a parrot, but the upper mandible the shorter of the two.—The digestive apparatus is very complicated. The gullet swells out into a crop, and there is a gizzard as muscular as that of a bird. The intestine, after a few convolutions, terminates in the cavity which contains the gills, at the base of the funnel by which the water is ejected after having supplied air for respiration. This cavity is situated within the mantle or bag, and separated from the other viscera by a membranous partition. Into it the water is freely admitted by means of a slit or valvular opening, being drawn in by muscular action, and again expelled with considerable force through the funnel, which opens at the neck, and with its current all secretions, eggs, and excrements are carried forth. There are only two gills in the greater number of existing C., the only exceptions being the two or three known species of *Nautilus*, which have four gills; and two-gilled C.—the order *Dibranchiata*—are in many respects of higher organization than the four gilled—the order *Tetrabranchiata*—which, although containing so few recent, contains a vast number of fossil species. Each gill consists of many membranous plates, fixed to two sides of a stalk.—The heart in the *Tetrabranchiata* consists of a single ventricle only; but besides this *systemic* heart, the *Dibranchiata* have two *branchial* or *respiratory* hearts, contractile reservoirs, one for each gill, by which blood is forced into these organs.

The 'arms' or 'feet' are very numerous in the *Tetrabranchiata*, not provided with suckers, but hollow, and with long retractile tentacula; in the *Dibranchiata* they are only eight or ten in number, furnished with suckers (*acetabula*); two of them, when they are ten in number, being much longer than the rest, and differing from them in form. The suckers are admirably constructed—an adhesive disk of muscular membrane, often having a cartilaginous circlet, capable of most exact application to any object, with an aperture in the centre leading into a cav

CEPHALOPODA.

ity, the bottom of which can be retracted like a piston so as to form a vacuum, and render the adhesion of the sucker close and firm, while on the muscular action being interrupted or reversed, it immediately lets go its hold. The Poulpe has each of its eight flexible arms crowded with 120 pair of such suckers, and as an animal of this kind exists on some tropical shores, with arms about two ft. long it is not wonderful that it is reckoned dangerous. Still more formidable, however, are the Hook-squids of the South seas, the two long arms of which have suckers furnished in the centre with a hook to enter into the flesh of any creature of which they may lay hold, and so more effectually to secure their prey.

The sexes are distinct in all the cephalopoda. The eggs have a horny covering, and after their extrusion from the parent become agglutinated into masses of various forms. The young, from the first, very much resemble the mature animals except in size.

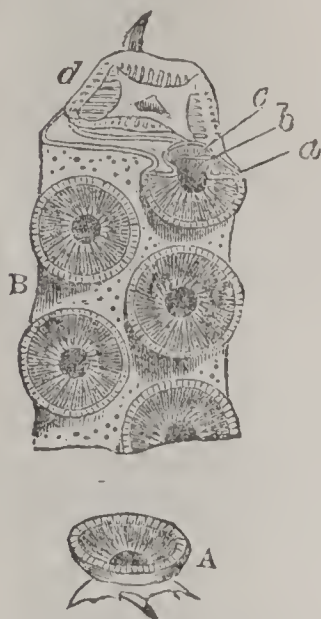
All the *Dibranchiata* are provided with a peculiar organ of defense, called an 'ink-bag,' which is wanting in the *Tetrabranchiata*. This ink-bag is filled with a peculiar secretion, capable of being expelled at will to darken the water, and facilitate the escape of the cephalopod.

The tetrabranchiate C. have a chambered shell. See NAUTILUS. The dibranchiate C. have no external shell—the shell of the female Argonaut (q.v.) being scarcely an exception—but they have an internal shell (cuttle-fish bone, etc.), sometimes merely rudimentary, included between two folds of the mantle, and apparently intended to give support to the soft body of the animal.

The C. all are very voracious, feeding on fish, mollusks, crustaceans, etc. Even a powerful crab is not safe from the attacks of a dibranchiate cephalopod little bigger than itself; the arms, so abundantly provided with suckers, seize it, and trammel every movement, while the parrot-like beak is strong enough to break the hard shell. Cuttle-fish and squids are often very troublesome to fishermen, following shoals of fish, and devouring great numbers of them after they are entangled in the net.

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Fossil C. are in all the strata which form the earth's crust. The order *Tetrabranchiata* is almost exclusively a fossil order, being represented by not more than four recent species. With the exception of two genera, *Nautilus* and *Aturia*, this order is confined to primary and secondary rocks. The two groups into which it is divided also are characteristic of geological epochs. The *Nautilidæ*, with



Cephalopoda, suckers of:
A, a single sucker, side view; B, a portion of one of the tentacula, with several suckers, front view; a, cartilaginous circle; b, central cavity; c, piston; d, section of the tentacle.

CEPHALOPTERA—CEPOLA.

simple or gently undulating septa, and siphuncle central or in the inner margin, belong, with the exception of the two genera just now referred to, to the Palæozoic rocks. Including a small group, which, while it has the siphon on the external margin, has yet simple septa, the *Nautilidae* are represented by 145 Silurian, 158 Devonian, and 91 Carboniferous species. The *Ammonitidae* have the siphuncle always on the outer margin of the shell, and the septa with corrugated or lobed margins. This group, with the exception of *Goniatites*, a Palæozoic genus, is peculiar to, and co-extensive with, the secondary strata. Of the 930 species that have been described more than half belong to the genus *Ammonites* (q.v.).

The order *Dibranchiata* is found first in the Lias, and extends through the more recent strata, receiving its full development in the present seas. Scarcely 90 fossil species have been described, while more than double that number are known as recent animals. See AMMONITES: ARGONAUT: BELEMNITES: CALAMARY: CERATITES: CUTTLE-FISH: GONIATITES: HOOK-SQUID: NAUTILUS: OCTOPODA: ORTHOCE-RAS: POULPE: etc.

CEPHALOPTERA, *sĕf-a-lŏp'te-ra* [Gr., head-wing]: genus of cartilaginous fishes of the Ray family, type of a sub-family, *Cephalopteridae*. The pectoral fins are very much elongated, so as to give great breadth to the fish. The tail is slender and without fin, but armed near its origin with a great spine. The head is terminated in front by a straight line, and on each side of it there projects a membrane (*pre-cephalic fin*) rolled upon itself, and resembling in shape a pointed horn. The name HORNED RAY has therefore sometimes been given to these creatures, of which only one species, *C. Giorna*, has ever been found on the British coasts.

It is not uncommon in the Mediterranean, and there acquires great size; one is mentioned as having been taken off Messina, which weighed 1,250 lbs.—more than half a ton. But this is small in comparison with the size of some of the *Cephalopteridae* which occur in tropical seas: one taken at Barbadoes required seven yoke of oxen to draw it. They are very dangerous to swimmers and bathers.

CEPHALO-THORAX, n. *sĕf'ă-lŏ-thŏ'răks* [Gr. *kēph'ălē*, the head; *thōrax*, the chest]: the anterior division of the body, composed of the coalesced head and chest, in many Crustaceæ and Arachnida.

CEPHALOTOMY, n. *sĕf'ă-lŏ-ŏt'ŏ-mĭ* [Gr. *kēph'ălē*, the head; *tomē*, a cutting]: the art or operation of dissecting or opening the head.

CEPHALOTUS, n. *sĕf'ă-lŏ'tŭs* [Gr. *kēphalŏtŏs*, having a head or top—from *kēph'ălē*, the head]: a genus of very singular dwarf pitcher-plants, having their leaves arranged in a rosette at the top of the rhizome, ord. *Ceph'ălŏtăcĕæ*.

CEPHEUS, *sĕfe-ŭs*: constellation of the n. hemisphere, containing, according to the Britannic catalogue, 35 stars: principal star, Alderamin, of the third magnitude.

CEPOLA: see BANDFISH.

CERAM—CERASTES.

CERAM, *sé-răm'*, Pg. *sā-rá'ōng*, or *sā-rowng*: island in the Moluccas archipelago; n.e. of Amboyna, between 2° 44' 30"—3° 30' 30" s. lat., and 129° 30'—130° 53' e. long.; divided into Great and Little Ceram by the Isthmus of Tarúno. Area, 7,140 sq. m. Malays inhabit the coasts; Papuans the interior. A mountain chain runs through C., rising in Núsa Keli to 9,250 ft. The soil is very fertile. The vegetable products include timber-trees, rice sago, maize, sugar-cane, bananas, and edible roots. The Malays fish. Exports are Ceram clothing, textiles, iron, copper-wire, earthenware, birds of paradise, trepang, sago, dried fish, edible nests, etc. C. belongs to the Netherlands. Pop. 195,000.

CERAMBYX, *sé-răm'bíks*: Linnæan genus of coleopterous insects, included among those which, on account of the length of their antennæ, are usually known as LONG-HORNED BEETLES, and now generally regarded as the type of a tribe or family. To this tribe belongs the Musk Beetle of England (*Callichroma moschata*), remarkable for its strong and agreeable odor, which, however, is rather that of roses than of musk. Some foreign species have the odor of musk in great perfection. *C. heros*, one of the largest European beetles, extremely rare in Britain, deposits its eggs in a hole which it excavates for that purpose in the wood of the oak; and the grub feeds upon the wood, excavating long passages through it.

CERAMIACEÆ, *sē-rā-mi-ā'sē-ē*: sub-order of *Algæ* (q.v.), called also **FLORIDEÆ**, and consisting of sea-weeds of a rose or purplish color, with fronds formed of cells arranged in rows, sometimes in a single row; the *sporocarps* containing cells or *spores*, often in fours (*tetraspores*), with a transparent *perispore*, and inclosed in receptacles of very various form and structure. They are most abundant in the seas of the n. temperate zone. Many are very delicate and beautiful. A considerable number furnish agreeable articles of food of a gelatinous nature, as **DULSE** (q.v.), **CARRAGEEN** (q.v.), or **IRISH MOSS**, and certain species of **PLOCARIA** (q.v.), much used on the sea-coasts of the e. Indiës. The edible swallows' nests of the East are supposed to be formed of a seaweed of this sub-order, a species of *Gelidium*.

CERAMIC, a. *sē-răm'ík* [Gr. *kerámos*, potter's clay, earthenware]: pertaining to pottery, or to the department of plastic art which comprises all objects made of clay, such as cups, vases, bassi-rilievi, cornices, and the like. **CERAMICS**, n. plu. *sē-răm'íks*, the art or science of pottery.

CERAMIDIUM, n. *sēr'ā-míd'í-ŭm* [Gr. *keramid'cō*, I cover with tiles; *keram'íōn*, a jar]: in *bot.*, an ovate conceptacle having a terminal opening, and with a tuft of spores arising from the base, as in *algæ*.

CERASIN, n. *sēr'ā-sín* [Gr. *ker'ásos*; L. *cer'āsus*, the cherry-tree—so called from *Cerasus*, a city of Pontus, in Asia]: that part of the gum of the cherry, the plum, and almond trees, insoluble in cold water. **CERASUS**, n. *sēr'ā-sūs*, a valuable genus of fruit-trees. *Ord. Rosacææ*.

CERASTES, *se-rās'tēz*, or **HORNED VIPER**: genus of ser-

CERATE—CERBEBUS.

pents of the family *Viperidae*, distinguished by a broad depressed heart-shaped head, the scales of which are similar to those of the back, and particularly remarkable for the development of one of the scales of each eyelid into a spine or horn, often of considerable length. The tail is very



Horned Viper (*Cerastes vulgaris*).

distinct from the body. This genus is exclusively African and very venomous. The best known species, *C. vulgaris*, the horned viper of n. Africa, was called *C.* by the ancients, the name being derived from the Greek *keras*, a horn. It was correctly described by the traveller Bruce, but his description was for some time regarded with incredulity. Other species of the same genus are *C. nasicornis* of the w. coast of Africa, and *C. caudalis* of the Cape of Good Hope.

CERATE, n. *sě'rāt* [L. *cera*, wax: It. *cero*: F. *cire*]: the melted honeycomb from which the honey has been pressed; a compound of wax with other oily and medicinal substances in such proportions as to have the consistence of an ointment (q.v.). Simple *C.* is made by melting together equal parts of white wax and olive-oil; they are heated together, and carefully stirred into a uniform substance while cooling. **CERA'TED**, a. covered with wax.

CERATIASIS, n. *sěr'ă-ti'ă-sis* [Gr. *kēras*, horn]: the growth of hard, horny tumors. **CERATITIS**, n. *sěr'ă-ti'tis*, inflammation of the cornea.

CERATITES, n. plu. *sěr'ă-tīts* [Gr. *kēras*, a horn]: in *geol.*, genus of ammonitidæ, peculiar to, and characteristic of, the 'Trias; distinguished from the other members of the family by having the lobes of the sutures serrated, while the intervening curves, directed toward the aperture, are simple. Twenty-six species have been described. **CERATODUS**, n. *sě-răt'ō-dŭs* [Gr. *odous*, a tooth]: a genus of fossil fish-teeth; a singular genus of fish found fossil in the secondary rocks, and now found living in Queensland (see **LEPIDOSIREN**). **CERATOSE**, a. *sěr'ă-tōs*, horny; having the texture and consistence of horn.

CERATIUM, n. *sě-ră'shĭ-ŭm* [Gr. *keratĭōn*, a little horn, a pod]: in *bot.*, a long one-celled pericarp with two valves, containing many seeds.

CERBERUS, n. *sěr'bě-rŭs* [L. *Cer'bērus*; Gr. *Kerberos*]: in Greek *mythology*, the many-headed dog of Pluto—offspring of Typhon and Echidna—who guarded the portal of the infernal regions. Later writers describe *C.* as only three-headed, with the tail and mane composed of serpents,

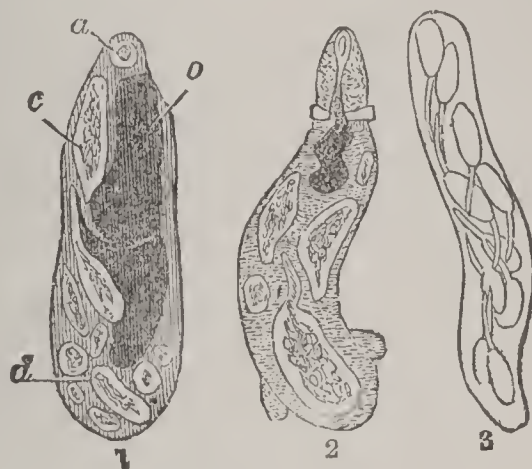
CERCARIA.

though the poets sometimes encumber him with a hundred heads.

A northern constellation, near the hand of Hercules, was named Cerberus by Hevelius.

CERCARIA, n. *ser-kā'rī-ă* [Gr. *kerkos*, a tail]: a tadpole-shaped animalcule; the tailed larva of the liver-fluke, or distoma. **CERCÆ**, n. plu. *sér'sē*, the feelers which project from behind in some insects. **CERCARIIFORM**, a. *sér-kā-rī'fawrm* [L. *forma*, shape]: tadpole-shaped like the larvæ of the liver-fluke.

CERCARIA, *sér-kā'ri-a*: name formerly given to a supposed genus of *Entozoa*, at first, from their minute size, mistaken for *Infusoria*, but now known to be the young of *Trematode Worms*. In the form to which the name C. was given, these creatures consist of an oval body with a thread-like tail; and swim about with great activity in water, but exhibit a strong instinctive propensity to penetrate into the soft bodies of insect larvæ, which they do by means of a spine-like weapon projecting from their head. The tail, as



Cercaria Sacs :

1. A sac two lines long; *a*, oral cavity; *b*, alimentary canal; *c*, a cercaria developed within the sac; *d*, sporulæ not yet developed into cercariæ. 2. The sac of a different species remarkable for its abdominal processes. 3. Another species, more simple in form and structure.

no longer needed, is now left behind, the closing of the wound through which the C. enters apparently nipping it off. Within the body which it enters, the C. loses also its spine, becomes encysted, and awaits its passive migration into an animal of higher kind, there to become a trematode worm. When it does not succeed in finding, in due time, a larva into which to enter, the C. gathers itself up into a ball; emits a mucous secretion, which soon hardens; and incessantly turning round within this mucous mass, becomes invested with a sort of shell, in which form it is not unlikely to be swallowed by some vertebrate animal. The C. is not the immediate offspring of a parent like itself. It is generated in a curious little animated sac (see figure, taken from Von Siebold's work on Tape and Cystic Worms), which is to be found buried among the organs of fresh-water mollusks, and within which this development

CERCELÉE—CERĒA.

of young takes place by gemmation. See GENERATIONS, ALTERNATION OF.

CERCELÉE, *sěr-sê-lā*, or RECERCELÉE, *re-sěr-sê-lā*, in Heraldry: a cross circling, or curling at the ends, like a ram's horn.

CER'CIS: see JUDAS' TREE.

CERCOCEBUS, *sěr-kō-sē'būs* [Gr., tail-ape]: genus of monkeys, natives of Asia and Africa, included by some naturalists in the large genus *Cercopithecus*. These monkeys have large cheek-pouches, large callosities, and long tails. The species commonly called MANGABEYS, or WHITE EYELID MONKEYS, are commonly referred to this genus, besides the CALLITHRIX, or GREEN MONKEY, and the MALBROUK, or DOG-TAILED BABOON.

CERCOPITHECUS, *sěr-kō-pĩ-thē'kūs* [Gr., tail-ape]: a genus of monkeys, containing a large number of species, natives of Asia and Africa, chiefly of Africa. They are called *Guenons* by French naturalists, but they have no common English name more distinctive than monkey. They have cheek pouches and callosities, and a long but not prehensile tail. A MONA, or VARIED MONKEY (*C. Mona*)—an African species—in the Parisian menagerie, was remarkable not only for the cunning and adroitness with which it searched and rifled the pockets of visitors, but also for the readiness with which it applied a key to the opening of a lock, untied knots, undid the rings of a chain, and performed similar feats.

CERDOCYON, *sěr-dōs'ĩ-on* [Gr., cunning-dog]: genus of *Canidæ*, apparently intermediate between true dogs and foxes, natives of S. America; called sometimes Aguara foxes. Their aspect is thoroughly vulpine, as are also their manners. Some of them add to the dispositions of ordinary foxes a singular propensity to steal and secrete brilliant or gaudy objects. A Brazilian species has been known to carry pocket-handkerchiefs into the woods. Some are natives of the coldest parts of S. America, and have a rich fur.

CERDONIANS, *sěr-dō'nĩ-anz*: sect of Gnostics (q.v.), named from Cerdo, their founder, a Syrian, who appeared in Rome abt. 140. They rejected the Old Test., and all the New Test. except parts of the writings of Luke and Paul.

CERE, v. *sěr* [L. *cera*; OF. *cere*, wax]: to cover with wax: N. the naked skin covering the base of the bill in some birds (see BILL). CE'RING, imp., spreading over with melted wax. CERED, pp. *-sērd*. CERE-CLOTH, n. *-klōth*, and also CERE'MENT, n. *-mēnt*, a cloth dipped in melted wax or some gummy matter, in which dead bodies were formerly wrapped. CERE'OUS, a. *sěr-rē-ūs*, and CERA'CIOUS, a. *-rā'shūs*, of or like wax; waxen. CE'RINE, n. *-rĩn*, the part of bees-wax soluble in boiling alcohol.

CERĒA, *chā-rũ'â*: town of n. Italy, about 19 m. s.s.e. of Verona; a straggling place, with the remains of an old

CEREAL

castle. The Austrians defeated the French here, 1798. Pop. 5,930.

CEREAL, a. *sē'rĭ-ăl* [L. *cerēālis*, pertaining to Ceres or grain—from *Ceres* (q.v), goddess of agriculture: It. and F. *céré-ale*]: pertaining to all kinds of grain used for food: N. one of the grain kind. CEREALIA, n. plu. *sē'rĕ-ā'ĭ-ă*, or CEREALS, n. plu. *zē'rĕ-ălz*, or CEREAL GRASSES, plants which produce grain or corn; in other words, all the species of grass (*Gramineæ*) cultivated for their seed as an article of food. They are called also CORN-PLANTS or BREAD-PLANTS. They belong to no particular tribes of the great order of grasses, but differ from each other botanically, perhaps as much as any plants within the limits of that order. The seeds of the grasses in general being indeed farinaceous and wholesome, the employment of particular species as bread-plants seems to have been determined chiefly by the superior size of the seed, or by the facility of procuring it in sufficient quantity, and of freeing it from its unedible envelopes. Some of the grains, as wheat and barley, are produced in ears or close-set spikes; some, as a few of those called millet, in spike-like panicles; others, as oats and rice, in very loose panicles. The form and size of the grains vary not a little, some being roundish, and some elongated; maize is the largest; many of the millets are very small. The plants themselves vary in size almost as much as their seeds, the millets being the smallest, and maize the largest of ordinary corn-plants.—Buckwheat and spurry are sometimes ranked with the C., but incorrectly, if the term is regarded as having any botanical limits, for they are not grasses; though their seeds are used in the same way. The quinoa of S. America, and the kiery (*Amaranthus*) of India, with other plants of different orders, might be added to the list on the same account; even the lotus of the Nile, the *Victoria regia*, and other species of water-lilies might thus be reckoned as cereal plants. The most extensively cultivated grains are wheat (*Triticum*), barley (*Hordeum*), rye (*Secale*), oats (*Avena*), rice (*Oryza*), maize or Indian corn (*Zea*), different kinds of millet (*Setaria*, *Panicum*, *Paspalum*, *Pennisetum*, and *Penicillaria*), and durra or Guinea corn (*Sorghum* or *Andropogon*). These all have been cultivated from time immemorial, and there is great uncertainty as to the number of species to which the many existing varieties belong; their original forms and native countries cannot confidently be determined. Barley, oats, and rye are the grains of the coldest regions, the cultivation of the two former extending even within the Arctic circle. Wheat is next to these, and in the warmer regions of the temperate zone its cultivation is associated with that of maize and rice, which are extensively cultivated within the tropics. The millets belong to warm climates, and durra is tropical or sub-tropical. Rice is the food of a greater number of the human race than any other kind of grain. Maize has the greatest range of temperature.—Besides these, other grasses are cultivated for grain to some extent, in different parts of the world; a species of *Eleusine* (mand) in India, another (tuccasso) in Abyssinia; a species of *Poa* (teff) in Abyssinia.

CEREBELLUM—CEREBRO-SPINAL MENINGITIS.

and a species of *Coix* (Job's tears) in India. Canary grass (*Phalaris*) also may be named. Canadian rice (*Zizania*) is used as a grain, but is scarcely cultivated, and the same remark applies to the manna grass (*Glyceria*) of n. Europe, to some species of bamboo (*Bambusa*), and to the sea lyme grass (*Elymus*), which affords an esteemed article of food, in small quantity, to the inhabitants of Iceland.

Of all the cereals, wheat is by common consent that of which the grain is best fitted for bread, though others are to some extent used for this purpose. But some, as rice and maize, are scarcely suited for it, and are prepared as food usually by other methods. All the grains are used also to produce some kind of fermented liquor or beer, and spirituous liquors are obtained from them by distillation.

The cereal productions of the U. S. in 1902 were corn, 2,523,648,312 bushels, valued at \$1,017,017,349; winter wheat, 411,788,666 bushels, valued at \$266,727,475; spring wheat, 258,274,342 bushels, valued at \$155,496,642; oats, 987,842,712 bushels, valued at \$303,584,852; barley, 134,954,023 bushels, valued at \$61,898,634; rye, 33,630,592 bushels, valued at \$17,080,793; buckwheat, 14,529,770 bushels, valued at \$8,654,704; and flaxseed, 29,284,880 bushels, valued at \$30,814,661; total cereal productions valued at \$1,861,275,110.

CEREBELLUM, n. *sěr'ě-běl'lŭm* [L. *cĕrĕbĕl'lŭm*, a small or little brain: It. *cerebello*]: the hinder or lower part of the brain. **CER'EBEL'LAR**, a. *-lĕr*, pertaining to the cerebellum: see **CEREBRUM**.

CEREBRATION, n. *sěr'ě-brā'shŭn* [L. *cĕrĕbrum*, the brain]: the action of the brain during any mental effort. **UNCONSCIOUS CERERRATION**, that activity of the brain alleged to produce intellectual or emotional results independent of any conscious effort of the mind.

CEREBRO-SPINAL FLUID, *se-rĕ'brō-spī'nal*: fluid found in the *sub-arachnoid space*, an interval between the two innermost membranes of the brain and spinal cord—viz., the arachnoid and the pia mater. This space, narrow on the surface of the cerebral hemispheres, is comparatively wide at the base of the brain between the two middle lobes of the cerebrum, and, posteriorly, between the hemispheres of the cerebellum and the medulla oblongata. The C. F. fills up the interval between the arachnoid and pia mater, and keeps the opposed surfaces of the former membrane (which is a closed serous sac) in contact. The C. F. is a clear, limpid, slightly-albuminous fluid, having a saltish taste, and a faintly alkaline reaction, and not containing more than 1.5 per cent of solid matters. It varies in quantity from two to ten ounces, and is said to be most abundant in aged persons. Its chief use is to afford mechanical protection to the nervous centres, and to prevent the effects of external shocks or concussions.

CERE'BRO-SPI'NAL MENINGI'TIS: see **MENINGITIS**.

CEREBRUM AND CEREBELLUM.

CEREBRUM, n. *sěr'ě-brŭm* [L. *cĕrĕbrum*, the brain]: the brain proper; the front or larger brain. **CER'EBRAL**, a. *brŭl*, pertaining to the brain. **CEREBRIC**, a. *sĕ-rĕb'rĭk*, of or from the brain. **CEREB'RIFORM**, a. *-rĭ-fawrm* [L. *cĕrĕbrum*; *forma*, shape]: shaped like the brain. **CEREBRIN**, or **CEREBRINE**, n. *sěr'ě-brĭn*, or **CEREBRIC ACID**, an organic acid of very complex composition, found in the liver, blood, and nerves, but especially in the brain of animals. **CEREBRITIS**, n. *sěr'ě-brĭ'tis*, inflammation of the brain. **CER'EBROID**, a. *-broyd* [Gr. *eidos*, shape]: like or analogous to brain. **CEREBRO-SPINAL**, a. *-brō-spī'nāl* [L. *spina*, the spine]: belonging to the brain and spinal cord.

CEREBRUM AND CEREBELLUM, *sĕr'ě-brum*, or *sĕ-rĕ-brŭm*, *sĕr-e-bĕl lŭm*: the two parts or regions of the brain. *Cerebrum* is sometimes applied to the whole contents of the cranium or skull; but usually it denotes the upper portion; while the under and posterior portion is called the *Cerebellum*, or little brain. For anatomical details see **BRAIN**. The uses of the various parts of the mass, as far as known, are as follows.

The *crura cerebri* appear as the principal conductors of impressions to and from the cerebrum. When one is divided, the animal moves round and round, from the injured toward the sound side, as if from a partial paralysis of the latter side. The effect may be referred to the interruption of the voluntary impulses from the cerebrum for although the cerebellum seems to have the office of combining the muscles, whose co-operation is necessary for each action, the effort of the will must proceed from the cerebrum.

The *corpora quadrigemina* (see **BRAIN**) are 'analogues of the optic ganglia of the lower animals.' Their removal wholly destroys the power of seeing, and diseases by which they are seriously affected are usually accompanied with blindness. Disease or destruction of one *corpus quad.* produces blindness of the opposite eye. Probably their connection with vision is not their only function.

The *optic thalami* probably participate slightly in the visual function of the *corpora quadrigemina*; but there is no definite evidence on this point. They are intimately connected with the power of movement. Destruction of one of them causes rotation of the animal, similarly to division of one of the *crura cerebri*. Longet has shown that after removing all the cerebral hemispheres and the *corpora striata*, the animal can still stand and walk, but that on removing one of the *optic thalami*, it falls down paralyzed on the opposite side, or commences rotatory motion.

The function of the *corpora striata* is uncertain; they have probably some connection of a nature unknown, with sensation and volition.

The parts hitherto considered—including the cerebellum—appear to comprise the apparatus (1) for the direction and government of all the unfelt and involuntary movements of the parts which they supply; (2) for the perception of sensations; and (3) for the direction of such instinctive and habitual movements as do not require exercise of any

CEREBRUM AND CEREBELLUM.

reasoning or intellectual act. They cannot be regarded as organs of the higher faculties of the mind.

The functions of the *cerebral hemispheres* are, in the words of Dr. Kirkes (*Handbook of Physiology*), those of organs by which the mind, 1st, perceives those clear and more impressive sensations which it can retain and judge according to; 2d, performs those acts of will, each of which requires a deliberative, however quick, determination; 3d, retains impressions of sensible things, and reproduces them in subjective sensations and ideas; 4th, manifests itself in its higher and peculiarly human emotions and feelings, and in its faculties of judgment, understanding, memory, reflection, induction, and imagination, and the like.

‘The evidences that the cerebral hemispheres are, in the sense and degree indicated above, the organs of the mind, are chiefly these: 1. That any severe injury of them, such as a general concussion, or sudden pressure by apoplexy, may instantly deprive a man of all power of manifesting externally any mental faculty; 2. that in the same general proportion as the higher mental faculties are developed in the vertebrate animals, and in man at different ages, the more is the size of the cerebral hemispheres developed in comparison with the rest of the cerebro-spinal system; 3. that no other part of the nervous system bears a corresponding proportion to the development of the mental faculties; 4. that congenital and other morbid defects of the cerebral hemispheres are, in general, accompanied with corresponding deficiency in the range or power of the intellectual faculties and the higher instincts. See MIND.

Cerebellum.—The functions of this organ have been the subject of much discussion and investigation. It is itself insensible to irritation, and has been cut away in various animals (by Longet and other French physiologists), without eliciting signs of pain; moreover its removal or disorganization by disease is generally unaccompanied with loss or disorder of sensibility, animals from whom it has been removed being apparently able to smell, see, hear, and feel, as perfectly as before. Flourens seems by his vivisections to have arrived at the correct view regarding the functions of this organ, and his results have been fully confirmed by Longet and others. He extirpated the cerebellum in birds by successive layers. Feebleness and want of harmony of the movements resulted from the removal of the superficial layers; when he reached the middle layers the animals became restless; their movements were violent and irregular; but they were not convulsed, and their sight and hearing were perfect. By the time that the organ was entirely removed the animals had completely lost the power of flying, walking, standing, and preserving their equilibrium. When a pigeon in this state was laid upon his back, it could not recover its former position; but fluttered its wings, and saw and tried to avoid a threatened blow. Hence volition, sensation, and memory were not lost, but merely the faculty of combining the actions of the muscles. From a series of experiments of this kind, subsequently made on all classes of animals, Flourens infers that the cerebellum belongs neither to the sensitive

nor to the intellectual apparatus; and that it is not the source of voluntary movements, although it belongs to the motor apparatus; but that it is the organ for the co-ordination of the voluntary movements, or for the excitement of the combined and harmonious action of the muscles.

This view is confirmed by the phenomena observed in certain cases of disease, and to a certain extent by comparative anatomy, for to each of the four classes of vertebrata—if amphibians and reptiles be reckoned as a single class—the species whose natural movements require the most rapid and exact combinations of muscular actions are those in which the cerebellum is most developed in proportion to the spinal cord; and if we compare different species of the same class, we usually find the development of the cerebellum to correspond very closely with the perfection and variety of the muscular movements. For example, in the frog the movements are exceedingly simple in character, consisting of little else than flexion and extension of the posterior limbs; and the cerebellum of this animal is extremely small compared with the rest of the brain, being merely a thin narrow band of nervous matter. In the common sea-turtles, the movements of the body are of a more varied character, and the motions of the head and neck are more extensive; and here we have a much more highly developed cerebellum. In the alligator, a reptile whose motions closely resemble those of quadrupeds, the cerebellum is still more fully developed.

The influence of each half of the cerebellum is directed to the muscles of the opposite side of the body, and for the right ordering of the movements, the actions of its two halves must be mutually balanced and adjusted; for if the nervous structures uniting one of the halves of the cerebellum with the medulla oblongata and spinal cord be divided, strangely disordered movements occur, the animal falling down on the side opposite to that which has been injured, and continually rotating round the long axis of its body, sometimes for several days, at the rate of fifty or sixty times in a minute. Similar movements have been observed in men in whom one of the crura of the cerebellum has been diseased.

Phrenologists are of opinion, in accordance with the view originally propounded by Gall, that the cerebellum is the seat of the sexual impulse and instincts; but this view has long been abandoned by almost all physiologists, for the reason that it has not been found sufficiently supported by anatomical and experimental facts, many of which are indeed directly opposed to it.

For information on many interesting topics in cerebral physiology, as, for instance, the duality of the brain, the plurality of the cerebral organs, etc., see Kirkes's *Physiology* (freely quoted above), Carpenter's *Human Physiology*, Noble *On the Brain*, Holland's *Chapters on Mental Physiology*, and Brodie's *Psychological Inquiries*.

CEREMENT, CERE-CLOTH: see under CERE.

CEREMONY, n. *sĕr'ĕ-mo-nĭ* [F. *cérémonie* — from L. *cæremōniā*, sacredness, reverence. a religious action or usage

CEREMONY—CERES.

—*1r.* Cæres or Cære (see CERVETERÉ), probably a place of religious resort among the most ancient Romans]: pomp or state in religious rites; outward forms or rites in religion; formal rules or regulations; the customary rules and forms of social intercourse; state etiquette. CER'EMO'NIAL, *a.* -*mō'nī-āl*, according to established forms or rites, as of the Jewish religion; ritual: *N.* outward form; a system of rites or rules established by authority. CER'EMO'NIALY, *ad.* -*lī*. CEREMO'NIOUS, *a.* -*ūs*, full of ceremony; formal; exact and precise. CER'EMO'NIOUSLY, *ad.* -*lī*. CER'EMO'NIOUSNESS, *n.* the practice of too much ceremony or formality. MASTER OF CEREMONIES, one who superintends and directs the forms and ceremonies to be observed on public or festive occasions.

CEREMONY, *sēr'e-mo-nī*: a religious form or usage; and indeed, almost any act, when performed in a regular, orderly, and formal manner, and when viewed, with reference not to its object, but to the mode of its performance. The more entirely the attention of the performers is withdrawn from the object of the act, and fixed upon the manner of its performance, the more *ceremonious* does it become. The purely formal character of C. is thus illustrated by Hooker: 'The name ceremony,' he says, 'we do not use in so large a meaning as to bring sacraments within the compass and reach thereof, although things belonging to the outward form and seemly administration of them are contained in that name.' The remark is applicable to the most trivial ceremonies of social life and of state pageantry, as well as to the most sacred rites of religion; for a C. which is its own object would scarcely be entitled to be regarded even as a ceremony. The most empty display has always the ulterior object of imposing on somebody.

Ceremonies may be divided into four classes: 1. Religious; 2. Social; 3. State; 4. International.

For religious and state ceremonies see their respective titles:—for the first: RITES: LITURGY: MASS: PROCESSIONS: etc.;—for the second: CORONATION: COURT: COURT, PRESENTATION AT: PARLIAMENT: etc. For social C.—see ETIQUETTE: PRECEDENCY: COURTESY: FORMS OF ADDRESS: etc. For international C.—see DIPLOMACY: CONSUL: AMBASSADOR: etc.

CEREOPSIS, *sē-re-ōp'sis* [Gr. wax-face]: genus of birds of the family *Anatidæ*, to which the New Holland goose (*C. Novæ Hollandiæ*) belongs. This bird has been known since the s. shores of that country were first visited by navigators. There, and on the adjacent islands, it is abundant; and the earlier navigators easily supplied themselves with fresh provisions by knocking the birds down with sticks, so little were they acquainted with the danger to be apprehended from man. The cere is remarkably large, whence the name.

CERES, *sēr'ēz*, in Mythology: a goddess, among the Greeks named *Dēmēter*, daughter of *Chronos* (Saturn), by *Rhea* (Ops), sister of Jupiter, Neptune, Juno, etc. She had

CERES—CERIGNOLA.

the misfortune, with her brothers and sister, to be devoured by her father, who, however, vomited her forth again after taking the emetic which Metis gave him. By her brother Jupiter she became the mother of Persephone or Proserpina (q.v.). The chief myth relating to C. tells how her daughter Proserpina was stolen by Pluto, and how the mother wandered far in quest of the maiden. After traveling in human form nine days, and everywhere distributing her gifts to mankind, she excited the pity of Jupiter, by whom Mercury was despatched to bring back Proserpina from the infernal world, but on the condition that she must spend there a third part (or, as others say, one-half) of every year. The myth of C. was symbolical of the growth of grain, which appears from under the ground; some consider that this is intimated in the name Demeter, which is thought to be equivalent to *ge meter*, 'Mother Earth.' The relations of the worship of C. with agriculture, social order, etc., were expressed in her two great festivals, the *Eleusinia* (q.v.) and *Ithesmophoria* (q.v.). C. was worshipped especially in Crete, Delos, Sicily, Asia Minor, Arcadia, Argolis, and Attica. Bulls, cows, pigs, honey-cakes, and fruits were offered to her. Among the Romans her festivals were styled CEREALIA; and of these the most interesting was the feast celebrated by the rural population shortly before harvest, when the country people, dressed in white, and crowned with oak-leaves, danced and sang harvest-songs in honor of the goddess. The feast in April lasted several days, and was celebrated by games of the circus. C. was represented usually in a chariot drawn by dragons, having her head crowned with a garland of corn-ears, and holding a torch, a basket, or a poppy in her hand.

CERES: one of the planetoids (q.v.), the first discovered. It was seen first by Piazzi at Palermo, 1801, Jan. 1. He continued to observe its motion till Feb. 13, when illness obliged him to discontinue his observations, which, however, enabled astronomers approximately to calculate its orbit. It was nearly a year before it again became visible, owing to its approach to the sun. C.'s magnitude is less than that of the moon, and it looks like a star between the seventh and eighth magnitude.

CEREUS, *sě'rē-ūs*: genus of plants of the nat. ord. *Cactææ* (q.v.). containing about 100 known species, among which are some of the most splendid flowers of that order. One of these is *C. speciosissimus*, now a common greenhouse plant, cultivated sometimes even in windows. Its large flowers are of a fine scarlet color, the inner petals with a violet tinge: they spring singly from the younger branches. The fruit, when well ripened, is of a delicious flavor. The plant is a native of Mexico.

CERIFEROUS, a. *sě-rĭf'ēr-ūs* [L. *cera*, wax; *fero*, I produce]: in *bot.*, bearing or producing wax. CEREOUS, a. *sēr'ē-ūs*, like wax; waxen.

CERIGNOLA, *chā-rēn-yō'lā*: town of Italy, province of Foggia, 23 m. s.e. of Foggia. It is divided into two parts—the old and new town, in the former of which a portion

CERIGO—CERINTHUS.

of the ancient walls remains—and it is celebrated for the decisive victory by the Spaniards over the French 1503, which established the supremacy of Spain in Naples. C. has manufactures of linen, and a trade in cotton and fruits. Pop. 25,400.

CERIGO, *chěr'ē-go*: one of the smaller of the seven Ionian Islands; now officially known again by its old Greek name *Cythera*. It is in the Mediterranean, separated from the coast of Morea by a narrow strait; area 107 sq.m., with a population est. at over 13,000. With the exception of a few tracts of land it is very barren, dry, and mountainous. In some parts, however, corn, wine, and olive-oil are raised. There are two great caverns in the island—one in the sea-cliff at the termination of the wild glen of Milopotamos; the other, known as the Cavern of St. Sophia, from a small chapel at its mouth dedicated to this saint, is about one and a half hour's ride from Capsali (q.v.), capital of the island. The former cavern is said to be three m. in length, and so low that it is necessary to creep, in many places, on hands and knees to explore it. The latter—that of St. Sophia—is very remarkable and singularly beautiful, abounding in enormous stalactites of various shapes. In ancient times, C. was sacred to Venus, being, according to the old mythology, the island that received this goddess when she arose from the sea.

CERINTHUS, *se-rin'thūs* (abusively named MERINTHUS, i.e., a halter): heretic who lived at the close of the apostolic age, but of whom we have nothing but uncertain and confused accounts. It is said that he was a Jew by birth, and studied philosophy in Alexandria. From Egypt he passed into Asia Minor, and lived in Ephesus contemporaneously (according to the belief of the church) with the aged apostle John. Tradition tells us that John held the heretic in such detestation that, on a certain occasion, when he encountered C. in the baths of Ephesus, he immediately left the place, saying to those about him: 'Let us flee home, lest the bath should fall while Cerinthus is within.' It was believed in the ancient church that the Gospel by the apostle John was written in opposition to the tenets of C.; and the Roman presbyter Caius (about the close of the 2d c.) supposed that C. had revenged himself by falsely ascribing the authorship of the Apocalypse to St. John—it being in reality his own work! The fathers contradict one another in their accounts of Cerinthus. Some describe him as a complete Gnostic, in which case he would be the earliest recorded teacher of that sect; others say that he held coarse and sensual millenarian views, making the *millennium* (q.v.), with the licentious fancy of an Arab, consist chiefly in 'nuptial delights;' and that he believed the Jewish ceremonial law to be in part binding upon Christians. There can be no doubt that C. made use of the Jewish law at least as a symbol for his Gnostic doctrines, and also employed millenarian terms in a symbolical manner; a very natural thing for him to do, on the hypothesis which Neander and others have suggested—that Gnosti-

CERISE—CEROMA.

cism originated, not among the minds which had received a true Hellenic culture, but among the Judaizing sects, whose theosophy was a jumble of the spiritual and the material. C. being the oldest teacher of Judaico-Gnostic principles, there would naturally be a greater incongruity and want of harmony in his language and ideas than characterized Gnosticism at a later period of its development; and subsequent ecclesiastical writers, destitute as all of them were of precise historical knowledge and sound principles of criticism, could hardly avoid misunderstanding his system which is not consistent throughout, but bears marks of being formed in a transition epoch. See Paulus (1799); Herzog's *Realencyklopädie* (new ed.); and the church histories.

CERISE, n. *sě-rēs'* [F. *cerise*, a cherry—from L. *cĕrāsūm*, a cherry]: a very fine shade of cherry or rose color, used in dyeing silks, etc., and artificial flowers; **ADJ.** of a cherry-red color.

CERITHIUM, *sē-rĭth'ĭ-ŭm* [Gr. *kerātĭŷn*, a small horn—from *kĕras*, a horn]: genus, the type of a family, *Cerithiadae*, of gasteropodous mollusca of the order *Pectinibranchiata* of Cuvier. The shell is spiral, elongated, and many whorled, with an oval oblique aperture which has a short canal in front. The species of this family are numerous most of them marine, but many inhabiting estuaries and brackish rather than salt water; some are found in lakes and rivers. A few belong to temperate climates, but most of them are tropical, and in mangrove swamps they abound. The fossil species are very numerous, almost all limited to the tertiary formations: see **BAGSHOT BEDS**.

CERIUM, n. *sē'rĭ-ŭm* [from the planet *Ceres*]: an elementary body, one of the rarer metals, found in the mineral **CERITE**, and a few other minerals. Its color is white. It forms two oxides and a numerous class of salts. It is not in quantity sufficient for use in any manufacture. **CERITE**, *sē'rĭt*, or **ÖCHRÖITE**, *Silicate of Cerium*; found as a mineral in gneiss, at Westmanland, Redderhyttan, and Bastnäs. It contains in 100 parts—silica, 16; peroxide of cerium, 26.55; oxide of lanthanum, 33.38; carbonic acid, 4.62; alumina, 1.68; peroxide of iron, 3.53; lime, 3.56; oxide of manganese, 0.27; and water, 9.1. It occurs in granular pieces of a clove-brown, cherry-red, or gray color, with a white streak, a splintery fracture, an adamantine lustre, and is translucent at the edges: see **LANTHANIUM**.

CERNUOUS, a. *sēr'nū-ŭs* [L. *cernūŭs*, bending or stooping with the head to the ground—from *cerno*, I discern]: in *bot.*, pendulous; nodding.

CEROGRAPHY, n. *sē-rōg'ră-fĭ* [L. *cera*, wax: Gr. *graphĕ*, a writing]: the art of engraving on a waxed copper plate.

CEROMA, n. *se rō'ma* [L. *ceroma*; Gr. *kĕrōma*, ointment for athletes; *kĕroō*, I anoint, I wax over; *keros*, wax]: that part of the ancient gymnasia and baths in which the athletes used to anoint themselves.

CEROON—CERTHIADÆ.

CEROON, n. *sê-rôn'* [Sp. *seron*—from *sera*, a large basket]: a bale or package in skins or hides.

CEROPLASTIC, n. *sê-rô-plās tîk* [L. *cera*, wax; Gr. *plastēin*, to form]: the art of modelling in wax: **ADJ.** modelled in wax: see **WAX-WORK**.

CEROSINE, n. *sêr'ô-sîn* [L. *cera*, wax]: a waxy substance found on the surface of the sugar-cane.

CEROSTROTUM, *sê-ro-strō'tūm*, or **CESTROTUM**, *sê-strō'tūm* [L.]: species of encaustic painting upon horn or ivory, the lines of the design being burned in with the *cestrum* or burning needle, and wax introduced in the furrows thus made.

CEROXYLON. see **WAX PALM**.

CERRETO, *chêr-rā'tō*: town of s. Italy, province of Benevento, on a slope of the Apennines, about 22 m. n.e. of Capua. It is a well built town, with a cathedral, and manufactures of coarse cloth. Pop. 6,000.

CERRIAL, a. *sêr'î-ăl* [L. *cerrus*, a species of oak]: in *OE.*, relating to the bitter oak or cerrus. **CERRUS**, n. *sêr'ūs*, or **CERRIS**, n. *sêr'îs*, the ancient name for the *Quercus cerris*, or bitter oak.

CERRO, *sêr'rō* [Sp.]: meaning height, mountain, forming part in the names of several places in Spanish America.

CERRO DE PASCO: see **PASCO**.

CERRO GORDO: plateau in Mexico, the most easterly on the route from Vera Cruz to the capital. Here, 1847, Apr. 18, the Americans, force of 8,500 under Gen. Scott, totally defeated the Mexicans, numbering 12,000 under Santa Anna. The United States troops lost 63 killed and 368 wounded; the Mexican loss was 1,000–1,200 killed and wounded and 3,000 prisoners.

CERRO GORDO DE POTOSI: the *Silver Mountain* of Potosi, in Bolivia: see **POTOSI**.

CERTAIN, a. *sêr'tin* [F. *certain*—from L. *certus*, sure; It. *certo*]: not doubtful; sure; that cannot be denied; unfailing; fixed or regular; particular. **CER'TAINLY**, ad. *-lî*, without doubt; without question; without failure. **CER'TAINTY**, n. *-tî*, a real state; exemption from doubt or failure. **CER'TES**, ad. *-têz* [F. *certes*—from L. *cērtē*, undoubtedly]: assuredly; in truth.

CERTALDO, *chêr-tâl'dō*: town of central Italy, about 18 m. s.w. of Florence; noteworthy as the residence of Boccaccio. His house is still standing, and contains the furniture belonging to the poet's time. Pop. 2,500.

CERTHIADÆ, *sêrth'î-a-dê*: family of birds, generally placed in the great order *Incessores* or *Passerina*, and tribe *Tenuirostres*, though some naturalists have ranked them in the order *Scansores*. They live mostly on the trunks and branches of trees, feeding on insects which they find in the crevices of the bark; and many of them aid themselves by their stiff tail-feathers in retaining their position as they search for their food on the perpendicular stem. Their claws are long and sharp; the hind-toe is also elongated.

CERTIFICATE—CERTIORARI.

gated, so that they can take firm hold of the bark or of a small branch; and many of them can pass round a horizontal branch; clinging to its under-surface with their backs to the ground. The bill of many is slender and curved; others, however, have a comparatively short and straight bill. The tongue is cartilaginous at the extremity, and so fitted to aid in seizing insect prey. The plumage is usually of dull and uniform color; but the birds are lively and active in their habits. The species are numerous and widely diffused; they are divided into a number of genera. All are small birds. The creepers (q. v.), forming the genus *Certhia*, are regarded as exhibiting the type of the family. Wrens and nuthatches, though referred to this type, depart considerably from it. Many small tropical and subtropical birds which live by sucking honey from flowers, formerly referred to this family, are now separated from it.

CERTIFICATE, *sér-tif-i-kāt*: a written (usually in some sense official) testimony to a fact. Law recognizes certificates for various purposes: 1. Annual C. of attorneys: see **ATTORNEY**. 2. C. of appointment of the creditors' assignees to a bankrupt's estate and effects. 3. C. of conformity of a bankrupt. 4. C. of counsel, to enable a pauper to litigate *in formā pauperis*. 5. C. of the judges of the superior common-law courts at Westminster, England, which are of various kinds and for various purposes. 6. C. of registry of a ship; which is a copy of what is entered in the register of the ship in the books of the custom-house. This C. is granted by the collector, comptroller, or principal officer of the customs at the port of registry, and delivered to the captain as a voucher of the character and privileges of the vessel.

CERTIFICATION, *sér-ti-fi-kā'shūn*, in the Law of Scotland: the judicial assurance given to a party of the course to be followed by the judge in case he disobeys the will of a summons, or other writ or order of the court.

CERTIFIED COPY: see **EVIDENCE**.

CERTIFY, v. *sér-ti-fī* [F. *certifier*, to certify—from L. *certificāre*—from L. *certus*, sure; *faciō*, I make]: to testify to in writing; to declare or inform positively. **CERTIFYING**, imp. **CERTIFIED**, pp. *-fīd*: **ADJ.** testified to in writing assured. **CERTIFIER**, n. *-fī-ēr*, one who. **CERTIFICATE**, n. *-tif-i-kāt* [F. *certificat*—from L. *certificātus*]: a declaration in writing to testify something; a testimonial of character: **V.** to give a status or position to by an authoritative written declaration. **CERTIFYING**, imp. **CERTIFICATED**, pp.: **ADJ.** declared in writing to have a certain status. **CERTIFICATION**, n. *-kā'shūn*, the act of certifying.

CERTIORARI, n. *sér'shī-ō-rā'rī* [mid. L. *certiorāre*, to certify—from L. *certior*, more certain]: writ issued from a superior court to an inferior court of record, demanding the transfer to the former of a cause pending; or calling for the record of a cause already adjudicated in the lower court; this legal process is equivalent to a Scotch advocacy or appeal. Its object is that the party may obtain more sure and speedy justice, from such justices as shall be as-

CERTITUDE—CERVANTES SAAVEDRA.

signed to determine the cause. A writ of C. may be granted at the instance either of the prosecutor or of the defender; and issues at the discretion of the superior court.

CERTITUDE, n. *sěr'ti-tūd* [F. *certitude*—from L. *certitūdō*, certainty—from *certus*, sure, certain]: certainty; freedom from doubt; assurance.

CERTOSA DI PAVIA, LA, *chěr-to'sâ dē pâ-vě'á*: one of the most celebrated monasteries in the world; in the neighborhood of Pavia; founded, 1396, by Giovanni Galeazzo Visconti, first Duke of Milan, to appease his conscience for the murder of his uncle. The church is a splendid structure in the form of a Latin cross, the ground-plan being 249 ft. long by 173 ft. broad. It has altogether 12 chapels, seven in the whole length of the church, and five in the transept, some of which are decorated with fine frescoes and paintings. The richly sculptured façade, designed by Ambrogio da Fossano, named Borgognone, was commenced 1473. The building is made up of various styles, but the Pointed prevails in the interior, which is decorated with frescoes, paintings, etc., by Dan Crespi, Andrea Solari, Campi, and Ambrogio Fossano, and contains a gorgeous high-altar, the mausoleum of the founder, and several monuments.

CERULEAN, a. *sě-ró'lí-ăn* [L. *cærul'ěūs*, dark blue]: blue; sky-colored. **CERULESCENT**, a. *sěr'ũ-lěs'ěnt*, in *bot.*, of a more or less sky-blue color. **CERULIFIC**, a. *sěr'ũ-líf'ík*, producing a blue or sky color. **CER'ULINE**, n. *-lín*, a preparation of indigo.

CERUMEN, n. *sě-ró'měn* [L. *cera*, wax]: popularly known as ear-wax; yellow waxy matter secreted by certain glands in the external auditory canal, or the passage that leads from the external opening of the ear to the membrane of the tympanum. Its main use, doubtless, is to lubricate this passage. It possesses a peculiarly bitter taste, and some physiologists have believed that in consequence of this property it prevents insects from entering the auditory canal. **CERUMINOUS**, a *sě-ró'měn-űs*, of or belonging to the cerumen.

CERUSE, n. *sěr'űz* [F. *céruse*—from L. *cerussa*, white-lead—from *cera*, wax]: a kind of paint having the appearance of wax; an ore of lead; carbonate of lead or white-lead, the basis of white oil-paint. Carbonate of lead has several other names—krems, Nottingham white, flake-white, etc. Like all other preparations of lead, C. is liable to be acted upon by exhalations from sewers, or by anything which contains sulphuretted hydrogen, in which case it is changed to a dull and leaden hue. It will not bear to be mixed with any pigment containing sulphur, such as vermilion. It is supposed that the white oxide of zinc might be substituted for C. as a white pigment with advantage.

CERUSSITE, n. *sě'rűs-sīt* [L. *cerussa*, white-lead: F. *céruse*]: carbonate of lead or white-lead ore; a common ore of lead found in beds or veins with *galena*.

CERVANTES SAAVEDRA, *sěr-văn'těz*, Sp. *thěr-văn'těs sâ-vă'drá*, MIGUEL DE: one of the greatest imaginative

CERVANTES SAAVEDRA.

writers of Spain : 1547, Oct. 9–1616, Apr. 23 ; b. at Alcala de Henares, of an old Galician family. He studied at Salamanca, and afterward at Madrid, where he was under the care of a learned theologian, Juan Lopez de Hoyos, prof. of belles lettres in the university. But his natural love of poetry led him to spend most of his time in writing elegies, ballads, sonnets, and a pastoral romance entitled *Filena*. When 22 years old, C. served for some time as valet-de-chambre to Cardinal Giulio Aquaviva, of Rome. In 1570 he served as a volunteer under the command of the papal admiral, Marco Antonio Colonna, and fought gallantly against the Turks. At the battle of Lepanto, he was maimed for life by a gunshot wound in the left hand. He afterward took part in various campaigns. Captured by an Algerine squadron, he was made a slave, but was ransomed 1580, after four years' captivity. On his return to Spain he rejoined his regt. in the army sent by Philip II. to support his claims in Portugal, and distinguished himself in the expedition to the Azores. In 1584, he returned to Spain, and retired to private life, to devote his attention to literature. Soon after his publication of the pastoral romance, *Galatea* (1584), he married, commenced writing for the stage, and produced, in the course of a few years, as many as 30 dramatic pieces, of which the tragedy *Nuñancia* is the most remarkable. During 1588–99 he lived in straitened circumstances in Seville. In 1605 he once more appeared as an author, and now in a sphere exactly suited to his genius. In his immortal work, *Don Quixote*, C. intended to put an end to that taste for extravagant romances of chivalry which had so long prevailed. The first part of this great satirical work appeared in Madrid, and was received at first coolly, but soon with loud applause, which, at a later period, was echoed from all parts of educated Europe. *Don Quixote*, though written with a satirical purpose, is throughout pervaded by the true spirit of poetry. With that universality which belongs to the highest genius, C. connected a universal human interest with descriptions of local and temporary characteristics. He did not intend by his *Don Quixote* to burlesque the old Spanish knight-errantry, for, as Mr. Ford remarks (see *Handbook of Spain*, part i., p. 238), 'the thing had expired a century before his birth ;' but to put an end to the absurd and affected romances which it was then the fashion to read, and which were believed to be true pictures of chivalry. He had also, it is quite clear, another object in view—viz., to show that the deeper and truer and more guileless a nature is the more will it become the jest and butt of real life ; but he likewise teaches that the pure heart and the high soul obtain a triumph which misfortunes and blunders cannot tarnish ; for the knight, always 'disinterested, generous, elevated, and beneficent,' though 'the sweet bells of his intellect are jangled and out of tune,' maintains throughout a hold on our affections and esteem. Charles Lamb has truly said, that readers who see nothing more than a burlesque in *Don Quixote* have but a shallow appreciation of the work.

CERVERA—CERVETERE.

Though received with enthusiasm, *Don Quixote* brought no pecuniary reward to the author. He was left in the obscurity and poverty in which he had passed so many years, and vainly endeavored to improve his circumstances. After silence during several years, C. published his twelve *Novelas Exemplares* (Exemplary Tales), 1613; his *Viage al Parnaso* (Journey to Parnassus), 1614—his next best production to *Don Quixote*; and in the following year he produced eight new dramas, but these were indifferently received. In 1614, a certain Alonso Fernandez de Avellaneda published at Tarragona a so-called continuation of *Don Quixote*, which was made a vehicle of abuse lavished on Cervantes. It appears that C. suffered considerably under these despicable attacks; but he revenged himself in noble style by publishing (1615) the *true* continuation of *Don Quixote*. Near the close of his career, C. found a patron in the Court of Lemos, who relieved his poverty. During the last few years of his life he resided in Madrid, where he died. No stone marks the spot where his remains were interred. His novel, *The Sorrows of Persiles and Sigismunda*, was posthumously published. In 1855, when the house in which the poet had lived in Madrid was rebuilt, a bust of C., by the sculptor Don Antonio Solá, was placed in the front.

CERVERA, *chěr-vā'râ*: town of Spain, province of Barcelona, 28 m. e. of the city of Lerida. It is on an eminence, is surrounded by old walls pierced with nine gates, and the w. approach is commanded by a castle, now in a ruinous condition. The Univ. of Lérida was removed here by Philip V. but was afterward transferred to Barcelona. The university building, a massive but unsightly edifice, is still standing. C. has manufactures of linen, woolen, and cotton fabrics. Pop. 5,300.

CERVERA Y TOPETE, PASCUAL: a Spanish naval officer; b. 1833, of notable parents, was graduated at the Naval Academy of San Fernando. In 1851 he entered active service, and 1859 became 1st lieut.; was promoted captain 1868, and later admiral. He took an active part in the 10 years' war in Cuba, when he succeeded in blockading the ports and preventing the landing of filibusters. In 1898, after the outbreak of war with the United States, he was placed in command of the squadron ordered against the American fleet operating in Cuban waters. After crossing the Atlantic he sailed to Santiago de Cuba, where he took refuge in the inner harbor. On July 3, while seeking to escape in compliance with the orders of his superiors, his entire squadron was destroyed. During the engagement the American fleet was under the official command of Rear-Admiral Sampson, but in the temporary absence of that officer, the actual command fell to Rear-Admiral Schley. The surviving officers of the Spanish vessels including Admiral Cervera, were sent as prisoners to Annapolis, Md., and soon afterward were released and permitted to return to Spain. Cervera by his kindly disposition and genial manners won the greatest admiration from his captors. In 1903 he was appointed a life senator.

CERVETERE, *chěr-vět'ā-rā*, or CERVETRI, *chěr-vā'trē* (anc. *Cære*, or *Ceres*, or *Agylia*): town of central Italy,

CERVIA—CESARI.

27 m. w. of Rome. Though now a place of only 700 or 800 inhabitants, it was formerly one of the most important cities of Etruria, possessing, it is said, a famous collection of paintings before even Rome was founded. After the Gallic occupation of the cap. C. declined, and, 1250, its people mostly removed to the present village of Ceri. Many Etruscan remains of value have been found at C. or Caere, which indeed seems to have had some connection with the religious rites of the early Romans: see CEREMONY.

CERVIA, *chěr'vĕ-â*: town of central Italy on the Adriatic, 13 m. s.s.e. of Ravenna. It is regularly built, has a cathedral and several convents; and from a marsh in the neighborhood about 50,000 tons of salt are annually obtained, the salt-works employing a considerable number of the population which is about 6,000.

CERVICAL, a. *sĕr'vĭ-kāl*, or *sĕr-vĭ'kāl* [mid. L. *cervicālis*, pertaining to the neck—from *cervix*, the neck: F. *cervical*: It. *cervice*]: pertaining to the neck.

CERVIDÆ AND CERVUS: see DEER.

CERVIN, MONT, *mōng sĕr-văng'* (Ger. *Matterhorn*; Ital. *Monte Silvio*): grand mountain mass of the Pennine Alps near Zermatt, in Switzerland, about 40 m. e.n.e. of Mont Blanc, and between the Valais in Switzerland and the Val d'Aosta in Piedmont. Above the glacier line, 11,000 ft. high, it rises in a bare obelisk of rock. It was long deemed inaccessible to the foot of man, and in spite of many resolute attempts, it was not till 1865 that the summit was reached. Mr. Whymper's party of four made the ascent successfully in that year; but in descending three of the party and a guide fell over a precipice 4,000 ft. high. Since then the peak has been repeatedly scaled. The Col of Mont C., used for horses in summer, is 10,938 ft. high.

CERVINARA, *chěr-vĕ-nâ'rá*: town of Italy, province of Avellino, 12 m. n.w. of Avellino. It has a trade in the produce of the district. Pop. 2,300.

CERVINE, a. *sĕr'vĭn* [L. *cervinus*, belonging to a deer—from *cervus*, a deer]: pertaining to a stag or deer. CERVINOUS, a. *-vĭ-nūs*, dark, tawny, or deep yellow with much gray.

CERVIX, n. *sĕr'vĭks* [L. the neck]: the back part of the neck; any part of an organ resembling a neck.

CESARI, *chĕ'zá-rĕ*, GIUSEPPE (sometimes called GIUSEPPINO or IL CAVALIERE D'ARPINO): 1570-1640 (or 42); b. Rome: painter. He was greatly honored by no less than five popes, and his paintings were always highly popular. His works—in fresco and oil—show lively imagination, gay coloring, and great tact in execution, but are deficient in natural simplicity, correctness of design, symmetry of arrangement, and dignity of style. As he was the most brilliant of the mannerists, he was the chief object of the attacks made by the artistic reformers, Caravaggio, the Caracci, and their followers—who constituted the *natural-*

isti—on the conventional or pseudo-idealistic style of painting. C. died at Rome.

CESARIAN, or CESAREAN, a. *sē-zā'rī-ăn*: in *surg.*, the operation of taking a child from the womb by cutting—said to have been performed at the birth of *Cæsar*; hence the name.

CESARIAN OPERATION, *sē-zā'rī-an*: popular name, from very ancient times, for *Hysterotomy* [*hystera*, uterus; *tome*, section]. Pliny distinctly alludes to it in his *Natural History* (lib. vii. cap. ix.), saying that Cæsar was so called from being taken by excision out of the womb of his mother, and that such persons were called *Cæsones* (Cæsar a cæso matris utero dictus; quâ de causâ *Cæsones* appellati). In his case, the mother must have survived the operation, as Aurelia was alive when her son invaded Britain.

The first incision is made exactly in the middle line of the body, to the length of 6 or 7 inches. When the uterus is exposed, it must be carefully opened, the child lifted out, and then the after-birth. The uterus now contracts, and sinks down into the pelvis, the wound is closed, and opium is given to the patient to allay pain and nervous irritability.

In Great Britain, the C. O. has been rarely performed, most likely from the skill of the accoucheurs rendering such a proceeding unnecessary; however, several cases are on record in which not only the child but the mother was saved. Some women, indeed, seem to have accepted it as their usual method of delivery, having several children, each requiring to be removed through an abdominal incision; one woman submitted to it seven times. It has also been successfully performed in most unfavorable circumstances. In the year 1500, a sow-gelder operated successfully on his own wife; an illiterate Irish midwife, Mary Donally, operated with a razor on a poor farmer's wife, 1738, Jan., and removed a dead child; her patient completely recovered, so as to be able to walk a mile on foot on the 27th day after the operation. A negro woman in Jamaica cut herself open with a butcher's knife, removed her infant, and recovered. Practitioners are not quite decided as to the circumstances which justify the performance of this severe operation on the living female, but all agree on the propriety of at once removing by it the child of a recently dead woman. Numa Pompilius decreed that every pregnant woman who died should be opened; and the senate of Venice, 1608, decreed that practitioners should perform, under heavy penalties, the C. O. on pregnant women supposed to be dead. In 1749, the king of Sicily decreed the punishment of death to medical men who omitted to perform it on women dying when advanced in pregnancy. When a resort to it is necessary, it must be performed immediately.

CESAROTTI, *chā-zā-rot'tē*, MELCHIORE: 1730, May 15—1808, Nov. 3; b. Padua: Italian poet. He gained reputation by the vigor and originality of his style, especially in his translation of Macpherson's *Ossian* (2 vols., Padua,

1763). The versification of this work, like that of C.'s free translation of the *Iliad*, under the title of *La Morte di Ettore*, was admired by Alfieri. C. unquestionably threw fresh life into Italian literature, but the enthusiasm could not have been rational which led him to think poor Macpherson a better poet than Homer. C.'s best work was his *Saggio sulla Filosofia delle Lingue* (Padua, 1785), in opposition to the academical pedantry of La Crusca. His prose style is vigorous, but full of innovations, especially Gallicisms.

CESENA, *chā-sā'nā*: town of central Italy, about 12 m. s.e. of Forli, on the Emilian Way. It is pleasantly situated on a hill-slope washed by the Savio. Its principal buildings are the *Palazzo Pubblico*, the Capuchin Church, and the library founded by Domenico Malatesta Novello, 1452, with a rich collection of MSS. There are many monasteries and nunneries, as befits a place that gave birth to two popes—Pius VI. and VII. It has some silk factories, with a trade in wine and silk, and in the vicinity are productive sulphur-mines. Pop. with commune (1891) 37,346.

CESPEDES, *thēs-pā'thēs*, or *ses'pā-dūs*, CARLOS MANUEL DE: 1819, Apr. 18—1874, Feb. 27; b. Bayamo, Cuba. He was educated at home and at the Univ. of Havana, admitted to the bar, travelled in Europe, killed a Spanish officer in a duel, and was involved with Gen. Prim in a conspiracy to overthrow the govt. Returning to Bayamo 1844, he gained an extensive practice and much influence, but his criticisms on the govt. and sympathy with Lopez and other revolutionists exposed him to suspicion and imprisonment, and forced him to remove to Manzanilla and afterward to Baracoa. He led the rising of 1868, freed the many slaves on his sugar estate, and on the field of Yara, Oct. 10, proclaimed Cuban independence. The republic was organized at Guimaro 1869, and C. elected pres. by the Cortes, Apr. 10. Five years later he was killed by the Spaniards; the movement was officially declared to be ended 1878, Feb. 21.

CESPEDES, PABLO DE: 1538–1608; b. Cordova, Spain. He was educated at Alcalá de Henares, studied art at Rome under Zuccherò, and, after some futile proceedings against him by the Inquisition at Valladolid, became prebend of the cathedral at Cordova, 1577. Accomplished in many directions he was most eminent as a painter and poet. Some of his pictures remain at Seville and Madrid; the best is a *Last Supper* at Cordova. Of his poem on *The Art of Painting*, considered the best didactic verse in Spanish, some 600 lines were preserved by Pacheco, 1649.

CESPITOSE, *sēs'pī-tōs*, or CÆS-[*L. cæspitem*, turf, a knot]: turfy; in *bot.*, applied to plants which are densely crowded in tuft-like patches; having their growth in tufts, as some common plants. CÆSPITULOSE, a. *sēs-pit'ū-lōs*, having the growth in numerous small tufts.

CESS, n. *sēs* [corrupted from Eng. *assess*: mid. L. *cessus* for L. *census*, the rating of Roman citizens according to their

property: *F. cens*, an annual quit-rent]: a permanent land-tax in Scotland; in *OE*, rate or measure; the term has long been used in England as synonymous with the more modern noun *assessment*. Camden, in the time of Elizabeth, speaks of every man being 'cessed by the pole, man by man, according to the valuation of their goods and lands' (see LAND TAX): *V.* to rate. CES'SING, imp. CESSSED, pp. *sĕst*. CESSOR, n. -*sĕs'er*, one who taxes or assesses. See CESSAVIT.

CESSA'TIO A DIVINIS: a prohibition of the Rom. Church which obliges the clergy to abstain from celebrating divine offices or giving church burial in some specified place. It is in some cases prescribed by the gen. law of the church, as when a church has been desecrated; but it may also be imposed on all who have power to inflict censure. It differs from an interdict in that it is particular, not general, and that while the former is a censure and inflicted to correct offenders it may be ordered as an expression of the church's sorrow, to repair some injury done to the divine honor.

CESSATION, n. *sĕs-sā'shŭn* [*F. cessation*—from *L. cessatĭōnem*, an idling (see CEASE)]: a 'ceasing; a stopping; a rest; a pause.

CESSAVIT, *sĕs-sā'vĭt* [*L.*, he has ceased—from *cesso*, I cease or stop]: a legal writ issued against a man who has ceased to pay rent or services for lands held by him, for two years together.

CESSIO BONORUM, *sĕsh'ĭ-ō bŏn-ō'rŭm* [*L. cessiō*, a giving up, a surrender; *bona*, goods, *bonŏrum*, of goods]: a surrender of goods or estate; a legal process in Scotland derived from Roman law, and in use also in various countries of continental Europe, by which a debtor obtains personal liberty and protection from imprisonment by his creditors, on making to them a full surrender of his goods or estate: see INSOLVENCY.

CESSION, n. *sĕs'shŭn* [*F. cession*—from *L. cessiōnēm*, a giving up: *L. cessus*, yielded, given way]: the act of giving way; a surrender of property, rights, or territory to another. CES'SIONAR'Y, a. -*ēr'ĭ*, having surrendered effects; yielding. CESSER, or CESSOR, n. *sĕs'sēr*, in *law*, a neglect to perform services or payment of rent for two years.

CESSPOOL, n. *sĕs'pŏl* [mid. *L. secessus*, a latrine, a privy: *Sp. secĕso*, excrement, stool: *AS. sesse*, a settle, a seat, and *Eng. pool*]: an excavation in the ground for the reception of foul water; a receptacle for liquid filth; a collection of offensive stagnant water. *Note.*—*Sus* or *sos* in prov. *Eng.* means hog-wash, a mixed or dirty mess, hence *cesspool*, is a mere corruption of *suspool*; comp. *L. sūs*, a hog—according to Skeat.

CES'TIUS, PYRAMID OF: Roman monument of the Augustan age, close to the Porto San Paolo, partly without and partly within the walls of Aurelian; in the immediate vicinity of the cemetery where Protestants dying in Rome are buried. The exterior form is perfectly pre-

CESTIUS.

served; but of the paintings which formerly decorated the internal walls only a few traces remain. Several copies of these paintings have been made, e.g., those edited by Falconieri, 1661. The pyramid is 125 ft. high, 100 ft. in width at the base; the walls 25 ft. thick. It is built of brick and tufa, faced with slabs of Carrara marble, now perfectly black with age, and rests on a base of travertine three ft. high. The interior contains burial chambers of considerable extent. The inner walls are covered with hard stucco, and the roof is vaulted. Both the walls and the roof were covered with paintings of female figures. The memory of the Caius Cestius, for whom this pyramid was built, has perished, but it has been supposed that he was the Cestius whom Cicero—in the oration *pro Flacco*—mentions as a rich man of business who, having no children, left a large sum of money for the erection of a monument to himself. Two fluted columns of white marble now standing before the pyramid of C. with their bases and two other bases were discovered in the excavations of 1663 at the foot of the pyramid. In the Prot. cemetery the remains of several celebrated men have their resting-place, among whom are the poets Keats and Shelley, Wyatt the sculptor, and Bell the anatomist.

CESTOID.

CESTOID, a. *sēs'toyd* [Gr. *kestos*, a girdle; *eidōs*, form]: like a girdle—applied to intestinal worms with long flat bodies, as the tape-worm. **CESTOID WORMS**, family of *Entozoa*, or intestinal worms, of the order *Cœlmintha* (q.v.) consisting of tape-worms and other creatures which resemble them in structure and habits. The number of different kinds of cestoid worms is great. Their natural history is important in reference to the health of human beings and of the most valuable domesticated animals; and although the subject is not in all respects agreeable, it presents much that is interesting and wonderful. Recent discoveries have given it an entirely new character.

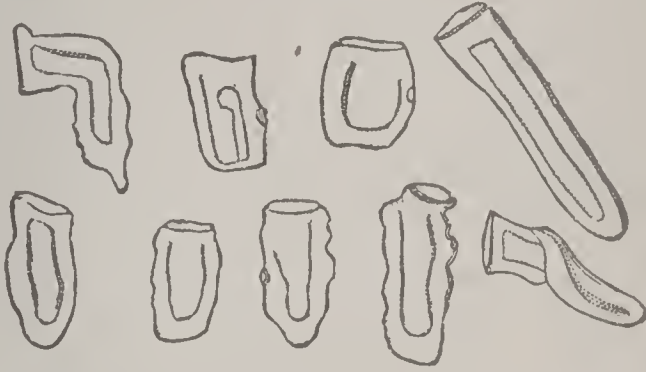
Cestoid worms, in their most perfect state, when alone they possess the form from which their name is derived, are in reality compound animals, like many zoophytes and ascidians. They do not, however, like these, subsist by food entering the system through mouths with which the individuals composing it are furnished; for the joints of a cestoid worm, the individuals composing the system or 'colony,' have no mouth, nor is there any mouth in what is, on various accounts, quite properly regarded as the head, but nutriment is obtained from the surrounding medium by *endosmose* (q.v.); nourishing juices, entering everywhere through the skin, as in the spongioles of the roots of plants, into the cellular tissue or *parenchyma* of which the whole body consists. The head of a cestoid worm is furnished with organs—different in different kinds—by which it affixes itself to the inner surface of the intestine of a vertebrate animal. When first it gets into this situation, the body is very short, and has no joints; but they soon begin to appear as transverse striæ, and gradually increasing in size, become in most of the kinds very distinct, and at last separate from the system in which they were produced, and are carried away out of the intestines of the animal which contained them. This does not take place, however, till they have not only become mature in their development of the sexual organs—the principal organs observable in them—but until they are full of what are called eggs, which, indeed, are rather young ones ready for a separate existence, each enveloped in a sort of protective shell. Each joint of a cestoid worm is androgynous. While the most matured joints are thrown off from the posterior end, new joints are continually formed, as at first, in the part nearest to the head. The number of joints thus formed from a single individual is very great, as will appear when it is considered that tape-worms have been found 20 feet long or upward, and that these have probably been throwing off joints in large numbers before opportunity has been obtained of measuring them.

As the cestoid worms have no mouth, so they have no alimentary canal. Some of them, as the true tape-worms, have been supposed to imbibe nourishment by the sucking disks of the head; but these are more probably mere organs of attachment, and the canals which are seen to arise behind them apparently belong, not to the digestive but to the vascular system, and are united by transverse vessels or

CESTOID.

vascular rings in the head and in each of the segments. The only trace of a nervous system hitherto observed is a single ganglion in the head, which in some is seen to send off nerves to the suckers.

The division into segments remains imperfect in some cestoid worms. Those of the genus *Ligula*—chiefly found in birds and fishes—resemble a long flat ribbon, not even notched along the edge, and containing a mere series of hermaphrodite brood-places. When segmentation is perfect, the segments (*proglottides*), on separating from the parent



Segments (*Proglottides*) of Common Tape-Worm :
In different States of Expansion and Contraction.
(From Von Siebold's work on Tape-worms.)

system (*strobila*), possess life and a little power of independent motion, creeping away on moist ground, plants, etc. Their period of separate existence, however, is brief; they burst or decay, and the numerous minute embryos which they contain are ready to commence their career, if in any way transferred into the stomach of an animal of proper kind, which is generally different from that whose intestine their parent inhabited. This may happen by the embryos being swallowed—or even the *proglottis* itself—together with water, grass, etc. Some of the cestoid worms in this embryo state find their appropriate place in the stomachs of vertebrate, and others in those of invertebrate animals.

The shell being broken or digested, the young cestoid worm is set free. It is extremely unlike the *proglottis* by which it was generated. It presents the appearance of a vesicle furnished with a few microscopic hooks. It has, however, a power of active migration by means of these hooks, and is able to perforate the stomach of the animal which contains it. To this its instinct seems immediately to prompt it, and it is so minute that it passes through the stomach without any serious inconvenience to the animal. It now probably gets into the blood, and is lodged in some of the capillaries, from which it makes its way again by perforation, until it finds a suitable place in some of the tissues or of the serous cavities, in the flesh, or in such organs as the liver or the brain; and here relinquishing all active migration, it rapidly increases in size, at the same time developing a head, which is in fact that of a cestoid worm, and generally either encysts itself or is encysted—included in a *cyst* (q.v.)—according to circumstances, or according to its

species. Great numbers of such parasites are sometimes present in a single animal, causing disease and even death. Until recently they were regarded by naturalists as constituting species and genera quite distinct from the cestoid worms, of which they are really the young; and the name *scolex*, formerly given to one of these supposed genera, has now become a common name for the young of all cestoid worms in this stage, as *larva* is the common name for the young of insects in their first stage after being hatched from the egg. Those scolices which inhabit vertebrate animals generally become distended with a watery fluid, and in this state were formerly regarded as hydatids (q.v.); little else, indeed, appearing without careful examination, but a small bag filled with fluid, the scolex head being formed within the bag, although capable of being everted from it, as the finger of a glove which has been drawn in at the end is turned out. Such is the young of the common tape-worm



Cysticercus Cellulosæ
(magnified):

a, the head, much magnified.

(*Tænia solium*), formerly known to naturalists as *Cysticercus cellulosæ*, and found in the flesh of the pig and of some other animals, and sometimes of man. It is this scolex, existing in great numbers, which produces in the pig the diseased state commonly known as *measly*; and it is very unsafe even to handle measly pork in a raw state, because a scolex accidentally getting into the mouth, and thence into the stomach, is

likely to become a formidable inmate of the intestinal canal. It does not appear that this particular species has the power of multiplying in its scolex state, or the circumstances in which it exists in the flesh of the pig may be unfavorable to its so doing, and the prodigious numbers sometimes existing in a single animal have probably all entered by the mouth in the way already described, the contents of a single proglottis or joint of a tape-worm being perhaps sufficient to account for them; but some scolices, as that called *Cœnurus cerebralis*, found in the brain of sheep, and the cause of the disease called *staggers*—now known to be the scolex of a *Tænia* of the dog—are proliferous by a sort of pullulation, so that clusters of scolices cover the same parental vesicle. Until, however, this scolex reaches the intestine of an animal suited to it, its propagation is entirely unsexual, and no organs of sex exist; but no sooner is it there than it begins to develop itself into a cestoid worm, and to produce androgynous joints, fertile of new embryos, as already described. Thus we have in these creatures an instance, in its relations the most important instance known, of the recently discovered alternation of generations: see GENERATIONS, ALTERNATION OF. The transference of the scolex from its place of growth to that in which it becomes a cestoid worm, usually if not always takes place by the animal which contains it being eaten by that whose intestine is suitable to its perfect development. Each kind of cestoid worm is lim-

CESTRACION—CESTUI QUE TRUST.

ited to certain kinds of vertebrate animals, and it has been proved by experiment that if introduced into the stomach of other kinds the scolices soon die. The only cestoid worms which infest the human species are *Bothriocephalus* (q.v.) *latus*, and tape-worms (q.v.). See Von Siebold's interesting work on *Tape and Cystic Worms*, printed for the Sydenham Soc. (London 1857).

CESTRACION, *sēs-trā'sī-on* or *sēs-trā'shūn*: genus of sharks, regarded as constituting a distinct family, *Cestraciontidae*, though not more than two species are known as now existing. It is characterized by having two dorsal fins and one anal, the first dorsal situated over the space between the pectorals and ventrals; a spine forming the front of each dorsal; a short wide tail, with its upper lobe strongly notched beneath; the mouth at the fore-end of the snout; spout-holes distinctly visible, rather behind the eyes; eyes destitute of nictitating membrane; small gill openings; and the front of the mouth armed with sharp angular teeth, while the margins and inner surface of the jaws are covered with pavement-like teeth, presenting a general continuity of surface, as in skates, and disposed in rounded oblique scrolls—the former evidently adapted to the seizing of food, the latter to the crushing and bruising of it. The Port-Jackson shark or 'Nurse' (*C. Philippi*) of the Australian seas, and the cat shark of Japan and China (*C. Zebra*), seem to differ chiefly in the patterns of color. The *Cestraciontidae* are particularly interesting to geologists; for the oldest fossil sharks belong in great part to this family, of which 'remains are found even in the palæozoic strata; they become more numerous in the carboniferous series; they are very numerous in the lias and chalk formations; but there they cease almost entirely, the strata of the tertiary series scarcely containing any of them;' while now the species are reduced, as we have seen, to one or two, and other types of shark have become more prevalent.

CESTRACIONTS, n. plu. *sēs trā'shī-ōnts* [Gr. *kestra*, a kind of fish, a pike, a weapon]: the oldest sub-family of sharks, all fossil except the Port Jackson shark and the cat-shark—called also the **CESTRACIONIDÆ**, n. plu. *sēs-trā'shī-ōn'ī-dē*, and **CESTRAPHORI**, n. plu. *sēs-trā'fō-rī* [Gr. *phorō*, I bear].

CESTRUM, *sēs'trūm*: style or spatula used by the ancients in encaustic painting in wax and ivory: see **ENCAUSTIC**.

CESTUI QUE TRUST, *sěst-wē kēh trūst*: in law, a person who possesses the equitable right to deal with property, the legal estate in which is vested in a trustee. There is such a confidence between the cestui que trust and his trustee, that no action at law will lie between them, but they must settle their differences and arrange their disputes in a court of equity. 'The phrase cestui que trust is a barbarous Norman law French phrase, and is so ungainly and ill adapted to the English idiom that it is surprising that good sense of the English legal profession has not long banished it, and substituted some phrase in the English

CESTIU QUE VIE—CESURA.

idiom, furnishing an analogous meaning.'—Wharton's *Law Lexicon*.

CESTUI QUE VIE: *sĕst-wĕ kĕh vĕ*: in *law*, a person whose continuance of life decides the duration of an estate.

CESTUS, n. *sĕs'tŭs* [L.—from Gr. *kestos*, a girdle embroidered]: the Venus or marriage girdle: a girdle worn by Greek and Roman women close under the breasts, and so distinguished from the *zone*, worn round the loins. The C. of Venus was covered with alluring representations, so that Juno borrowed it when she desired to win the love of Jupiter.



Roman Cestus.

CESTUS, or, more correctly, **CÆSTUS** [Lat. *cædere*, to slay]: name of the covering for the hands worn by Roman pugilists; a sort of boxing-glove. It was at first nothing more than a leathern thong or bandage to strengthen the fist; but afterward it was covered with knots

and nails, and loaded with lead and iron, etc., to increase the force of the blow. It was not uncommon for a pugilist armed with the C. to dash out the brains or break the limbs of his antagonist. The Roman pugilist (*castuarius*) was often represented in sculpture.

CESURA, n. *sĕ-zŭ'ră* [see **CÆSURA**: also Latham]: the pause which naturally occurs in reciting a line of poetry. **CESURAL**, a. *sĕ-zŭ'răĭ*, of or pertaining to a cesura.

CETACEA.

CETACEA, *se-tā'se-a*, or *sē-tā'shē-a*: order of Mammalia (q.v.) greatly differing in general form and habits from the rest of that class, so as indeed to be popularly reckoned among fishes. The C. have a fish-like form, terminating in a fish-like tail or tail-fin, which, however, is not vertical, as in fishes, but horizontal, and is the great instrument of progression; being moved by very powerful museles, commonly with an oblique downward and lateral movement, like that by which a boat is propelled in sculling, but sometimes by direct upward and downward strokes, when greater velocity is requisite.

There are no hinder limbs, and even the pelvis is represented only by two small rudimentary bones, suspended in the soft parts, so that the body tapers gradually and uninterruptedly toward the tail. The fore-limbs are exclusively, or almost exclusively, adapted for swimming; their bones, however, appearing in the skeleton as those of a hand, placed at the extremity of an arm, of which the bones are much abbreviated and consolidated, with little power of motion except at the shoulder-joint, and are entirely concealed in the soft parts of the animal. The head is connected with the body without any



Tail-fin of Whale.



Bones of Fore-limb of Whale.

apparent neck, and the vertebrae of the neck are partly anchylosed or soldered together. The skin is naked, having no general covering of hair, although some of the species possess conspicuous whiskers. The C. agree with quadrupeds, notwithstanding the great differences already indicated, in the most important parts of their organization.

They are viviparous, and suckle their young, for which they exhibit great affection; they are also warm-blooded, breathe by lungs, and not by gills, and come to the surface of the water for the purpose of inhaling air. An approach to their fish-like form is to be seen in seals (q.v.) and other *Phocidae* (q.v.), in which, however, the hinder limbs are largely, although peculiarly developed, while the fish-like tail-fin is lacking; the skin has a covering of hair; and the head and fore-limbs more resemble those of ordinary quadrupeds.

The C. are usually divided into two sections—*Herbivorous C.* and *Ordinary C.*; but the former, constituting the family of *Manatidae* (q.v.), have recently, by some systematic naturalists, been rejected from this order altogether, and made a separate order, *Sirenia*. They differ very widely from the ordinary or true C., not only in their adaptation for the use of vegetable instead of animal food,

which appears both in their dentition and in their digestive apparatus, but also in their pectoral instead of abdominal teats, and in their want of *blow-holes* and of any provision for retiring to great depths of the ocean, and remaining there for a considerable time without returning to the surface to breathe

The ordinary or true C. are divided into the families of *Delphinidæ* (dolphin, porpoise, beluga, bottlenose, narwhal, etc.), *Physeteridæ*, or *Catodontidæ* (cachalot, or spermaceti whale, etc), and *Balenidæ* (Greenland whale, rorqual, etc.), for the distinguishing characters of which, see the respective titles. They all feed on animal food some of them pursuing and devouring fishes; others, and these the largest, subsisting chiefly on smaller prey, mollusks, small crustaceans, and even zoophytes, which they strain out of the water by a peculiar apparatus in their mouths. None of the true C. have molar teeth or grinders like the *Manatidæ*; all the teeth which any of them have are conical; but some of the largest are entirely destitute of teeth. The females of all of them have the teats situated far back on the abdomen. The fore-limbs of the true C. are mere fins, the slight power of grasping with them, which *Manatidæ* possess, have entirely disappeared. The resemblance to fishes is increased in many of them by the presence of a dorsal fin. There is a wonderful provision to enable them to spend some time under water, before returning again to the surface to breathe—an arterial plexus or prodigious intertwining of branches of arteries, under the pleura and between the ribs, on each side of the spine. This being filled with oxygenated blood, after the animal has spent some time at the surface breathing, the wants of the system are supplied from it, while breathing is suspended, so that some whales can remain below even for an hour. The position of the nostrils is remarkable, almost on the very top of the head, so that the animal can breathe as soon as the head comes to the surface of the water; and the nostrils are furnished with a valve of singular but very perfect construction, a sort of conical stopper of fibrous substance, preventing the ingress of water even under the pressure of the greatest depths. The nostrils appear to be little used for the purpose of smelling, the sense of smell being one which these animals either do not possess at all, or in a very imperfect degree; but they are much used, not only for breathing, but also for *spouting*, or the ejection of water from the mouth, for which reason they are generally called *blow-holes*—the water being forced through them by the compression of two large pouches or reservoirs which are situated beneath them. This compression is accomplished by an action similar to that of swallowing; the throat, however, not being open, but closed. The height to which the water is thrown into the air is extraordinary, and the spouting of the whale is one of those wonders of the ocean never to be forgotten by those who have seen it.

A peculiarity in the skin of the true C. adapts them for their manner of life. The skin is extremely thick, the

CETACEOUS—CETERACH.

inner part of it consisting of elastic fibres interlacing each other in every direction, the interstices of which are filled with oil, forming the substance usually called *blubber*. The oil deposited in this unusual situation, not only serves the ordinary purposes of fat, but that also of keeping the body warm, which to a warm-blooded animal, continually surrounded with water, is one of great importance; while the elasticity of this extraordinary skin affords protection in the great depths to which some of the whales descend, and in which the pressure must sometimes amount to a ton on every square inch.

The number of known species of C. is not great, but their natural history has as yet been very imperfectly studied. All of them are large animals, some of them by far the largest that now exist. Almost all—both herbivorous and ordinary—are marine, but some of the smaller species ascend large rivers to a great distance from the sea; and one, of the family *Delphinidae*, belongs exclusively to fresh waters, being found only in the upper tributaries of the Amazon and the elevated lakes of Peru.

Fossil Cetacea have been discovered hitherto only in the Tertiary formation. Their remains represent species not only belonging to each of the recent families of true C., but have supplied materials for forming a new family intermediate between the true whales and the herbivorous cetacea. These fossils were originally described as reptiles; but they have been satisfactorily shown to be carnivorous C. by Owen, who, from their remarkable conjugate teeth, has given the typical genus the name of *Zeuglodon* (q.v.), and the family that of *Zeuglodontidae*. In all, six or seven species have been described belonging to this family, from the Eocene and Miocene beds of Europe and America. The *Delphinidae* appear first in the Miocene strata, and continue through the newer beds. The remains of a narwhal, which cannot be distinguished from the living species, have been found in several places in England. Of *Physeteridae*, three species have been noticed in Pleiocene and Pleistocene strata, belonging to the recent genus *Physeter*. Fossil *Balaenidae* occur in the Miocene and newer beds. Only four species have been described, excluding *Cetotolites* (q.v.), a name given to teeth and ear-bones, belonging to animals of this family, which occur in great numbers in the Suffolk Crag.

CETACEOUS, a. *sē-tā'shūs* [Gr. *kētos*; L. *cētus*, a whale-It. *ceto*]: pertaining to the whale kind. CETACEAN, n. *sē-tā'shī-ān*, an animal of the whale kind. CETA'CEA, n. plu. *-shī-ā*, or CETA'CEANS, n. plu. *-shī-ānz*, animals of the whale kind. CETINE, n. *sē'tīn*, the solid crystalline mass of spermaceti. CETIOSAURUS, n. *sē'shī-ō-saw'rūs* [Gr. *sauros*, a lizard]: in *geol.*, a genus of marine saurians. CETOLOGY; n. *sē-tōl'ō-jī* [Gr. *logos*, discourse]: the natural history of cetaceous animals.

CETERACH, n. *sēt'ē-rāk* [F. *cétérac*; It. *oitracca*, spleen-wort]: a genus of polypodaceous ferns, one species is the native fern, *Mitt-waste* or *Scale-fern*.

CETINE—CEUTA

CETINE, or **CETIN**, n. *sě'tín* [F. *cétine*—from L. *cetus*, a whale; Eng. suf. *-ine*]: the pure, solid, crystalline mass of spermaceti. It occurs in beautiful silvery scales.

CETOTOLITES, n. plu. *sě-tót'ō-lits* [Gr. *ketos*, a whale; *ota*, the ears; *lithos*, a stone]: name given by Owen to fossil cetacean teeth and ear-bones, which are found in great abundance in the Red Crag of Suffolk, England, a member of the pleiocene period. They are rubbed and water-worn, and they have evidently been washed out of some earlier strata, which remain yet unrecognized. The extent of these earlier strata must have been very great, seeing that the remains now extend over a large district in Essex and Suffolk, and attain a thickness in some places, of not less than 40 ft. Professor Henslow, 1843, drew the attention of agricultural chemists to this deposit, as a source of materials for manure, and since then superphosphate manures have been manufactured from it to the value of many thousand pounds annually, an example of the valuable practical results of a purely scientific discovery.

CETRARINE, n. *sět'rā-rĭn* [mod. L. *cetraria*; Eng. suf. *-ine*]: the bitter principle of the *Cetraria islandica*, or Island-moss.

CETRARO, *chā-trá'rō*: town of s. Italy, province of Cozenza, on the Mediterranean, 24 m. n.w. of Cozenza. It has anchovy fisheries; pop. 2,619.

CETTE, *sět*: seaport town of France, dept. of Hérault; on a neck of land between the lagoon of Thau and the Mediterranean, in lat. 43° 24' n., long. 3° 42' e. The town, which is entered by a causeway raised above the Thau lagoon, and a bridge of 52 arches, is fortified, and the harbor is defended by a citadel and forts. The space inclosed by the piers and breakwater forming the harbor is about 30 acres, and has a depth of 16 to 19 ft. A broad, deep canal, lined with excellent quays, connects the port with the Lake of Thau, and so with the Canal du Midi and the Rhone, thus giving to C. an extensive inland traffic; it has likewise an active foreign commerce. The principal trade is in wine, brandy, salt, dye-stuffs, perfumery, and viridigris. C. has ship-building yards, and fisheries of oysters and anchovies. Pop. (1876) 28,152; (1891) 36,541; (1901) 33,246.

CETTIGNE, or **CETINJÉ**: see MONTENEGRO.

CEUTA, *sū'ta*: town belonging to Spain; in the kingdom of Fez, on the n. coast of Africa, opposite Gibraltar; lat. 35° 54' n., long. 5° 16' w. It is strongly fortified, and defended by a citadel and forts erected on Mount Hacho, the ancient *Abyla*, or south pillar of Hercules. It is the most important of the four Spanish *presidios*, or convict establishments, on this coast. The harbor is small and not very safe, and the population is composed of Spaniards, Moors, Negroes, Mulattoes, and Jews, mostly very poor. In 1899 a plan to strengthen the fortifications was abandoned on representations from England to the Spanish cabinet. C., formerly called *Septa* or *Septum*, was taken from the Vandals in 534 by Justinian, who fortified the place anew. In 618, it fell into the hands of the Western Goths: afterward it was taken by the Moors, who

CEVADILLA—CEVENNES.

held it until 1415, when it was captured by the Portuguese. It was annexed to Portugal, to the crown of Spain, 1580, and was the only place on the African coast retained by Spain when Portugal was restored to its independence in 1640. Pop. (1900) 13,000.

CEVA, *chā'vā*: town of Italy in the province of Cuneo, at the junction of the Cevetta and Tanaro rivers, 11 m. e. of Mondovi, 26 m. e. of Coni. It was formerly a place of much milit. importance, and is at the foot of a rock which was surmounted by a strong citadel. In the middle ages it was the centre of a separate marquisate; during the 16th and 17th centuries it was several times captured by the French and Spaniards; 1796 it was taken by Augereau; and 1800 it again fell into the hands of the French, who destroyed the castle. It has extensive iron works and silk factories, and has a large trade in its cheese, which was famous even in the time of the Romans. Pop. 4,929.

CEVADIL'LA: see SABADILLA.

CEVENNES, *sā-vēn'* (anc. *Cebenna*): chief mountain range in the s. of France. With its continuations and offsets, it forms the water-shed between the river-systems of the Rhone and the Garonne. Its general direction is from n.e. to s.w., commencing at the s. extremity of the Lyonnais mountains, and extending under different local names as far as the Canal du Midi, which divides it from the n. slopes of the Pyrenees. The central mass of the C. lies in the depts. Lozère and Ardèche, Mont Lozère reaching an elevation of 4,884 ft., and Mont Mézen (the culminating point of the chain), 5,794 ft. The average height is 3,000 to 4,000 ft. Their masses consist chiefly of amphibolic rocks, grauwacke, and limestone, covered with tertiary formations, which in many places are interrupted by volcanic rocks.

The C. is celebrated as the arena of furious religious warfare. As early as the 12th c., the several sects known by the names, the 'Poor of Lyon,' the *Albigenses* (q.v.), and the *Waldenses* (q.v.), were known and persecuted in this district. After the revocation of the edict of Nantes by Louis XIV., 1685, a series of cruel persecutions of the Protestants in the C. began, especially in 1697, after the peace of Ryswick. 'Dragonnades' (q.v.) were employed to enforce the doctrines of the monks sent as missionaries into the heretical district. All persons suspected of Protestantism met with the most harsh and cruel treatment. Some of the inhabitants emigrated, others fled into the fastnesses of the mountains. Driven to desperation, the persecuted people at length rose to arms, and the murder of the Abbé du Chaila, who was at the head of the dragonnades, gave the signal of a general insurrection, 1702. The insurgent peasants were styled *Camisards* (q.v.)—possibly from *camise*, a smock worn by the peasantry. Headed by bold leaders, the most famous of whom were Cavalier and Roland, they defeated the troops sent against them by Louis again and again, until that king thought the insurrection

CEYLON.

of sufficient importance to require the presence of the distinguished general, Marshal Villars; but he was recalled before the revolt had been put down, and it was left to the Duke of Berwick to extinguish it in blood; the contest terminating in an entire desolation of the province, and the destruction or banishment of a great portion of the inhabitants. The embers of religious hatred still remained glimmering through the following century, and, after the restoration of the Bourbons, 1815, burst out in flames in the terrible persecution of the Protestants in Nîmes (q.v.) and other places in the s. of France. See *Histoire des Troubles des Cévennes*, by Count de Gébelin (1760); Schulz's *Geschichte der Camisarden* (1790); Bray's *Revolt of the Protestants of the C.* (1870).

CEYLON, *se-lon'* or *sīl-ōn'* (the *Taprobane* of the Greeks and Romans, and the *Serendib* of the *Arabian Nights*): great island and a British colony in the Indian ocean, s.e. of the peninsula of Hindustan, from which it is separated by the Gulf of Manaar and Palk's strait. Recent observations have shown its true place to be between $5^{\circ} 55'$ and $9^{\circ} 51'$ n. lat., and $79^{\circ} 42'$ and $81^{\circ} 55'$ e. long. Extreme length from n. to s., from Point Palmyra to Dondera Head, 270 m.; greatest width, from Colombo to Sangemankande, 140 m. Area, including dependent islands, 25,364 sq. m., of which more than one-fifth is under cultivation. Pop. (1901) 3,578,333. For pop. of the various provinces, etc., see below (*population*).

Physical Features.—In natural scenery, C. can vie with any part of the world; and as it comes into view rising from the ocean, clothed with the rich luxuriance of a tropical vegetation, it seems to the voyager like some enchanted island of eastern story. Its hills, 'draped with forests of perennial green,' tower grandly from height to height, till they are lost in clouds and mist. Near at hand, a sea of sapphire blue dashes against the battlemented rocks that stand at isolated points, and the yellow strands are shaded by groves of noble palms. In shape C. resembles a pear, but its inhabitants more poetically compare it to one of their elongated pearls. Undulating plains cover about four parts of the island, and the fifth is occupied by the mountain-zone of the central s., which has an elevation of 6,000 to 8,000 ft. above the sea. Pedrotallagalla, the highest mountain in the range, attains the height of 8,280 ft.: the celebrated mountain of Adam's Peak, 7,420 ft.; and the table-land of Neuera Ellia, 6,210 ft.

Geology.—The mountain system is composed mainly of metamorphic rocks, chiefly gneiss, frequently broken up by intruded granite. With the exception of some local beds of dolomitic limestone the gneiss is everywhere the surface rock, and the soil is composed of its disintegrated materials. No fossils, as was to be expected, have been noticed in C., if we except the semi-fossil remains of mollusca, crustacea, and corals, belonging to living species, in the rude breccias of the n. in the neighborhood of the sea. The n. part of the island is rising, and there also the land

is making encroachments on the sea from another agency. The immense masses of corals continually increasing, retain the débris brought from the Indian continent by the currents of the sea, and thus form a flat, ever-increasing madrepora plain.

Of *metals and minerals*, iron in the form of a carbonate, can be obtained in great quantities, and of such purity as to resemble silver. Tin is found in the alluvium at the base of the mountains, and on the heights the rare metal tellurium has been discovered. Nickel and cobalt are scarce. Anthracite and rich veins of plumbago are on the southern range of hills. The *gems* of C. have been celebrated from time immemorial, and they are most plentiful in the alluvial plains at the foot of the hills of Saffragam. Sapphires, rubies, the oriental topaz, garnets, amethysts, cinnamon stone, and cat's-eye, are the principal gems and precious stones of the island. The most valuable is the sapphire; and one of these, found 1853, was worth more than \$20,000. The value of the precious stones annually found in the island is estimated at \$50,000. The pearl fisheries of C. have long been famous, and since the beginning of the century are conducted directly for behoof of the government. But the fishing is intermittent. Thus there was no fishing from 1863 (product \$230,000) till 1874 (product \$47,500). The product of 1879-80 was \$145,000; of 1881, \$529,000; of 1887, \$195,000.

Rivers.—The most important river in C. is the Mahawelli-ganga. It has its source in the vicinity of Adam's Peak, and after draining more than 4,000 sq. m., it separates into several branches, and enters the ocean near Trincomalee. The s. side of the island is watered by ten rivers of considerable size, which flow into the sea between Point de Galle and Manaar. On the e. coast the rivers are smaller, but still more numerous, and many others traverse the n. and e. provinces.

Harbors.—Point de Galle (q.v.) and Trincomalee (q.v.) are the two harbors of Ceylon. The former is small and dangerous; the latter is unsurpassed as a safe and commodious port. The variation of the tides is very small; the rise and fall not generally exceeding 18 to 24 inches, with a third of increase at spring-tides.

In *climate* C. has a great advantage over the mainland of India, and as an island enjoys more equable temperature. The average for the year in Colombo (q.v.) is 80° in ordinary seasons. April is the hottest month; and in May the s.w. monsoon commences amid a deluge of rain, and continues the prevailing wind till Oct., when the n.e. monsoon sets in: 80 inches is the average annual fall of rain, though in an exceptional year, 120 inches have been registered. The beautiful tableland of Neuera Ellia, was visited by Europeans first 1826, and is now used as a sanatorium. Here the thermometer in the shade never rises above 70°, while the average is 62°; the nights are cool and refreshing. The n. of the island, including the peninsula of Jaffna, the plains of Neuera Kalawa, and the Wanny, may be reckoned as a third climatic division. Here the

annual fall of rain does not exceed 30 inches, and irrigation is largely employed in agriculture.

Flora.—The general botanical features of C., especially of the lowlands, are nearly identical with those of s. India and the Deccan, though it possesses a few genera of plants not found in those regions. Its phænogamic plants are limited to about 3,000. The beautiful ixoras, erythras, buteas, Jonesias, and other flowering shrubs bloom in the forests. At an elevation of 6,500 ft., the acanthaceæ cover large tracts of ground, and the tree-fern reaches the height of 20 ft. On the highest ground, rhododendrons attain the size of timber-trees. The coral tree (*Eurythrina Indica*), the murutu (*Lagerstræmia Regiæ*) and the *Jonesia asoca* are among the most magnificent of the flowering trees. The fig tribe are planted in the vicinity of the temples. In the forests, climbing-plants and epiphytes of prodigious size and striking appearance cover the trees with a mass of parasitical foliage of extraordinary growth. The palmaceæ are very conspicuous in the vegetation of C., although not more than 10 or 12 species are indigenous: the eocopalp—of which it is estimated there are not less than 20 millions of trees—the taliput, the palmyra—which forms extensive forests in the n. of the island—and the jaggery palm, are the most noteworthy. Of timber-trees, 416 varieties are known, and among these the satin-wood holds first rank. The flora of the highlands, above 2,000 ft., and up to 6,000 or 7,000, though much resembling that of the Neilgherries, has a marked affinity to the vegetation of the highlands of Malacca and Java, especially the latter.

Fauna.—A knowledge of the fauna of C. has been greatly advanced by the labors of Drs. Templeton and Kelaart and Mr. Edgar Layard. *Quadrumanous* animals are represented by the *Loris gracilis*, and five species of monkeys. Sixteen species of the *Cheiroptera*, or bat tribe, exist in C.; and it is very remarkable that many of these rival the birds in the brilliancy of their colors. The *Pteropus Edwardsii* (the flying-fox of Europeans) measures from 4 to 5 ft. from tip to tip of its extended wings. Of the larger *Carnivora*, the bear and leopard; and of the smaller, the palm-cat and the glossy genet (the civet of Europeans), may be mentioned. The dreaded tiger of India, the cheeta, the wolf, and the hyæna, are happily not met with in Ceylon. Deer, buffaloes, and the humped ox of India are among the *Ruminantia*; the little musk-deer (*Moschus meminna*) is less than two ft. in length. The *Pachydermata* are represented by the elephant and the wild boar; the former, usually tuskless, is emphatically lord of the forests of Ceylon. The most remarkable of the *Cetacea* is the dugong. Whales are captured off the coast. 320 species of *Birds* have been ascertained by Drs. Templeton and Kelaart and Mr. Layard. The song of the robin and long-tailed thrush, and the flute-like voice of the oriole, are heard over the whole mountain zone, and far down into the neighboring plains. There are also eagles, the beautiful peregrine falcon, owls, swallows, kingfishers, sun-birds, bulbuls, crows, parroquets, pigeons, pea-fowl, jungle-fowl and

many other of the feathered tribe. Myriads of aquatic birds and waders, among which the flamingo is conspicuous, cover the lakes and lagoons. The crocodile is the largest reptile in the island; tortoises and lizards also are found. There are a few species of venomous snakes, and of these the tiepolonga and the cobra da capello are the most deadly.

Inhabitants.—The Singhalese, most numerous of the natives of C., are descendants of those colonists from the valley of the Ganges who first settled in the island, B.C. 543. In their customs, costume, and general appearance, they have remained unchanged since the days of Ptolemy. The dress of the men, who have delicate features and slender limbs, is singularly effeminate, and consists of a *comboy* or waist-cloth, very much resembling a petticoat; their long hair, turned back from the forehead, is confined with combs, and earrings are worn as ornament. The women, in addition to the comboy, cover the upper part of the figure with a white muslin jacket, and adorn themselves with necklaces, bangles, rings, and jewelry. The Singhalese are false and cowardly, but show strong affection for their relatives, and reverence for old age. Polyandry still lingers in the interior of C., and was formerly universal; it is now, however, almost confined to the wealthier classes, among whom one woman has often three or four husbands. The Kandians, or Highlanders, are a more sturdy race, and maintained their independence for three centuries after the conquest of the low country by European settlers. The Malabars, or Tamils, have sprung from those early invaders of C. who from time to time swept across from s. Hindustan, and contended with the Singhalese kings for the sovereignty of the island. They have formed the chief population of Jaffua for full 2,000 years, and constitutionally excel the Singhalese and Kandians. The Moormen, most energetic and intelligent of the native communities, are met in every province as enterprising traders. They are a very distinct race from the Singhalese, but have no tradition of their origin. Europeans generally believe them to be of Arab descent, but Tennent is of opinion that 'they may be a remnant of the Persians, by whom the island was frequented in the fourth and fifth centuries.'

The 'burghers' of C. are a people of European descent, who have become naturalized. Those of Portuguese extraction hold the lowest place, and are mostly tradesmen and artisans; but the Dutch burghers frequently fill responsible posts, and are employed in the government offices.

Besides the races already alluded to, there is a remarkable tribe of outcasts—the Veddahs—hardly removed from the wild animals of the forest, and believed to be descended from the Yakkhos, the aboriginal inhabitants of the country. They occupy a district in the e. part of the island, and have there preserved their ancient customs and manner of living unaltered for more than 2,000 years. They appear to be without the instinct of worship, and the knowledge of a God. The tribe is divided into the *Rock Veddahs* and the *Village Veddahs*. The former hide themselves in the jungle, live by

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the chase, and sleep in trees or caves. They use fire to cook their meat, and their greatest gastronomic treats are the iguana lizard and roasted monkey. Their language—if the few words they make use of can be called by that name—is a dialect of the Singhalese. The Village Veddahs locate themselves in the vicinity of the European settlements, on the e. coast, living in rude huts of mud and bark, and are hardly more civilized than their brethren of the jungles. The exertions of government to reclaim this harmless but degraded people have in some degree succeeded, and a promising colony has been formed.

Population.—Sir J. E. Tennet is of opinion that C., when in the height of its prosperity, must have been ten times as densely peopled as at the present day. At the censuses of 1891 and 1901 the figures for the nine provinces of Ceylon were as follows (military included) :

PROVINCES.	Area in sq. m.	Population. 1891.	Population. 1901.
Central	2,304	472,609	623,011
Uva	3,725	159,889	192,072
North Central	4,047	74,606	79,110
Western	1,371	704,007	925,342
Sabaragamuwa	2,085	258,414	321,755
Northwestern	3,024	319,774	353,845
Southern	1,980	489,667	566,925
Eastern	3,657	149,610	174,288
Northern	3,171	319,633	341,985
Total	25,364	3,008,239	3,578,333.

Europeans (1901) 9,583; Eurasians and Burghers, 23,312.

Religion.—The Singhalese are devoted to Buddhism (q.v.), which is the prevailing religion of the island. It does not exist, however, in that state of purity in which it is still found in the Indo-Chinese peninsula. Its sacred books are identical with those of Burmah and Siam, and both record the doctrines of Gautama in the Pali language; the deviations are in matters of practice. The Malabar kings adulterated Buddhism to a considerable extent with Brahmanism, introducing the worship of Hindu deities into the Buddhist temples, and this continues more or less. More than once have the Buddhists of C. sought to restore the purity of their faith—at one time sending deputies to Siam, at another to Burmah, with this purpose. The Burman or Amarapura sect have long been the reformers of Singhalese Buddhism, and maintain no very friendly relations with the party who, supported by the priests of Siam, acknowledge the civil power in matters of religion, sanction the worship of Hindu deities and the employment of the priesthood in secular occupations, uphold caste, and restrict the sacred books. Caste was acknowledged by the Singhalese prior to the introduction of Buddhism, which in principle is opposed to it; but so firmly was it rooted that it still endures, though

* Including 4,836 British and 17,866 whites of European descent. The total in 1871 was 2,405,287.

more as a social than a sacred institution. Gautama Buddha is said to have visited C. three different times to preach his doctrine, and his *Sri-pada*, or sacred footstep, on the summit of Adam's Peak (q. v.), still commands the homage of the faithful. Buddhism was not, however, permanently introduced into C. till B.C. 307, when Mahindo, obtaining the support of the king, established it as the national faith. The influence of the priests gradually increased, and, by the piety of the Singhalese kings, monasteries were richly endowed; for though the Buddhist monk individually is forbidden to possess goods, a community may own property to any extent; and it is a remarkable fact that, at the present day, no less than one-third of the cultivated land of the island is computed to belong to the priesthood, and is exempt from taxation. The priests of C. are divided into two orders—the *Samanaros*, and those who, after a time of probation, receive the higher grade of *Upasampada*. The fraternity are not raised by education above their countrymen, and the respect paid them is directed more to the dress than to the person of the individual. Any member is at liberty to lay aside his ascetic character, and return to a secular life. The most celebrated Buddhistic relic in C. is the *Dalada*, or sacred tooth of Gautama, at Kandy,

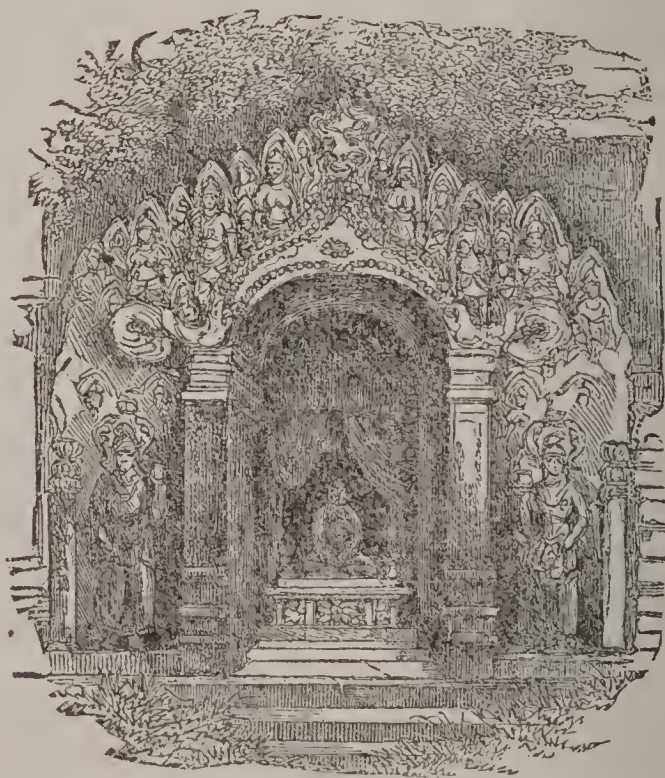


The Gal-wihara at Pollanarrua.

which is guarded with jealous care, and preserved in an elegant shrine; but it is well known that the original relic was destroyed by the Portuguese, and the present substitute is a piece of discolored ivory, bearing no resemblance to a human tooth. In all Buddhist countries, the sacred buildings present, with certain modifications, the same general character (see **BUDDHISM: BURMAH: etc.**); and in C. we find the three classes represented by the dagoba, or relic-shrine [*datu*, a relic, and *gabbhan*, a shrine], the temple proper, and the vihara or monastery. The labor bestowed on these edifices in the early ages of the Singhalese monarchy is astonishing. In the n. of the island, ruined cities—buried for ages in the depths of the forest, have been discovered, revealing monuments that in dimensions may almost compare with the pyramids of Egypt. The most remarkable of these vestiges of an early civilization is

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Pollanarrua, ancient capital of C.; and here is the celebrated *Gal-wihara*, a rock-hewn temple, supposed 'the only example in Ceylon of an attempt to fashion an architectural design out of the rock, after the manner of the cave-temples of Ajunta and Ellora.' The reclining figure of Gautama on the right (see cut, which, with the other illustrations, are reduced from Sir J. E. Tennent's *Ceylon*), is 45 ft. in length; the upright one measures 23 ft.; and the sitting image on the left is 16 ft. from the altar to the top of the head. The cave-temple of Dambool was built B.C. 100, and is the most celebrated in the island. The bell-shaped, tapering dagobas of C., as relic-shrines, answer to the pagodas of Burmah—which they much resemble—and the topes of Afghanistan. The ruins of the Jay-tawanarama dagoba still reach the height of 249 ft.; their diameter is 360 ft.; and from base to pinnacle they are covered with trees of the largest size. This enormous structure contains twenty millions cubical ft.; and Sir J. E. Tennent concludes that to erect such a mass of masonry, even in the present day, 'would occupy 500 bricklayers



Entrance to the Temple of Dambool.

from six to seven years,' at the cost of five millions of dollars. The Ambustella of Mihintala is another remarkable dagoba. A very famous object in connection with Buddhism in C. is the sacred Bo-tree of Anarajapoorā (*Peepul*, *Ficus religiosa*), planted B.C. 288, by far the oldest tree in the world of which an authentic history exists: see BO-TREE. Among the antiquities of C. must be mentioned those wonderful monuments of the former greatness of the Singhalese people—the ruined tanks; with which almost nothing of a similar kind, whether ancient or modern, can be compared; 30 colossal reservoirs, and about 700 smaller tanks, remain, though for the most part in ruins. The

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restoration of these magnificent works of irrigation has recently been begun. Brahmanism or Hinduism (q.v.) is the faith of the Tamils or Malabars, but the Moormen are Mohammedans. After the expulsion of the Dutch Christians, Protestant missions to the natives of C. were commenced by the Baptists, 1813. The Wesleyan Methodists



The Ambustella Dagoba, Mihintala.

followed 1814, the Americans 1816, the Church of England 1818, and Christianity has made progress among the native populations. Of these the peasantry of the Kandy hills have proved the least accessible to its influence. Schools, collegiate institutions, and female seminaries, under the direction of the missionaries, are in successful operation.

Government.—The administration of C. is vested in a governor, who is assisted by an executive council of five members, and a legislative council of 17 members. The governor's salary is £7,000 per annum. In 1901 the revenue was \$8,812,000, and the expenditure \$8,630,000. The chief items of revenue are the customs, averaging £286,000; licenses, £150,000; sales and rents of public lands, £230,000. In 1886–90 the annual revenue varied from \$4,438,891 to \$5,680,069, and the expenditure from \$4,554,573 to \$5,360,678. The civil establishment of C. cost nearly \$1,032,936. Value of imports and exports during 5 years as follows:

Years.	Total Imports.	Total Exports.
1886	\$15,749,524	\$12,214,930
1887	18,112,367	14,006,604
1888	20,483,746	13,784,097
1889	21,243,297	16,423,576
1901	37,532,000	34,280,000

The principal articles of export, 1890, were: Coffee, valued at 5,741,838 rupees (rupee—35 cents); cinchona, 1,053,497 rupees; tea, 22,899,759; plumbago, 3,925,776 rupees; cocoanut products, 7,832,475 rupees; areca nuts, 1,051,083 rupees. The principal articles of import were: Cotton goods, 5,592,545 rupees; salt fish, 1,734,957 rupees; rice, paddy, etc., 23,225,538 rupees; coal and coke, 6,650,806 rupees; spirits, etc., 517,779 rupees; wines, 282,924 rupees.

The value of the staple coffee exported from Ceylon to

the United Kingdom was (1879) 3,001,075. Owing to disease, the product has been very greatly reduced. It was (1886) £579,126; (1887) £578,104; (1888) £434,677; (1889) £258,340; (1890) £347,822. In 1890 cocoa-nut oil valued at £191,101, and cinchona at £183,996, were exported to the United Kingdom.

To the ancient world, C. was famous as a place of traffic. Egyptians, Greeks, Romans, Persians, and Arabians traded to its ports; and many particulars, such as geographical position and natural productions, are thought to identify Point de Galle with the Tarshish of the Hebrew historians.

The *history* of C., in brief outline, may be conveniently divided into ancient and modern; and the latter into the Portuguese, Dutch, and British periods.

The records of its early history came to light 1826, and Mr. Turnour, applying himself to their study, composed an *Epitome of the History of C.*, from B.C. 543 to A.D. 1798; and he records the reigns of 165 kings, who reigned during this space of 2,341 years. The most famous of the Singhalese books is the *Mahawanso*, a metrical chronicle, in the Pali language, which gives an account of the island during the above 23 centuries. The story begins with the invasion of Wijayo (B.C. 543), son of a petty Indian sovereign in the country watered by the Ganges. He subdued the Yakkhos, the aboriginal inhabitants; married a daughter of one of the native chiefs, whom he subsequently repudiated for an Indian princess; and founded a dynasty that held undivided sovereignty in C. for nearly eight centuries. He bestowed on his kingdom his patrimonial name of Sihala (whence Singhalese, Ceylon), and promoted the settlement of colonists from the mainland. In the reign of king Deveniapiatissa (B.C. 307), Buddhism was established as the national religion, and his reign was further remarkable by the planting of the sacred Bo-tree, B.C. 288; and then was begun the erection of those stupendous buildings already noticed. The next important epoch in Singhalese history is the usurpation of the Malabars (B.C. 237), foreign mercenaries from the Coromandel coast, to whom the native sovereigns had intrusted the defense of the island. Several Malabar invasions are chronicled in the history of C., and these foreigners long contended with the native princes for supreme authority. Passing on to A.D. 1071, a native dynasty was then re-established in the person of Wijayo Bahu, which, for 100 years, delivered the country from the dominion of the Malabars. Prakrama Bahu commenced, in 1153, a reign the most renowned in the records of Ceylon. He devoted himself to religion and agriculture, and, besides many notable religious edifices, he caused no less than 1,470 tanks to be constructed, subsequently known as the 'seas of Prakrama.' Thirty years after the death of this monarch the Malabars landed with a large army, and speedily conquered the whole island. In 1235, a native dynasty recovered a part of the kingdom. During the reign of Dharma Prakrama IX. the Portuguese first visited C., 1505; but it was in 1517 that they first formed a permanent settlement at Colombo for trading purposes. Their encroachments soon raised the patriotic Kandyans, and it is a remarkable fact that though at the first visit of the Portuguese in 1505 they were even ignorant of the use

of gunpowder, they, after awhile, excelled their enemies as musketeers, and were finally able to bring 20,000 stand or arms to bear against them. 'Amity, commerce, and religion,' was the Portuguese motto; but their rule in C. is a sad story of rapacity, bigotry, and cruelty. They were at last driven from the island by the Dutch in 1658, after a contest of 20 years, when, as Sir J. E. Tennet remarks, 'the fanatical zeal of the Rom. Cath. sovereign for the propagation of the faith was replaced by the earnest toil of the Dutch traders to intrench their trading monopolies, and the almost chivalrous energy with which the soldiers of Portugal resisted the attacks of the native princes was exchanged for the subdued humbleness with which the merchants of Holland endured the insults and outrages perpetrated by the tyrants of Kandy upon their envoys and officers.' But the purely military tenure of the Dutch was destined to give place to the colonization of the British. It was during the great European war succeeding the French revolution, that the English gained possession of the island. 1795, Aug. 1, an expedition under Col. James Stuart landed at Trincomalee, which was speedily captured, and finally the garrison of Colombo surrendered on 1796, Feb. 16. By this capitulation, all the Dutch settlements and strongholds in C. were ceded to the English; though the island was not formally annexed to the British crown till the peace of Amiens, 1802, Mar. 27. The native sovereigns, however, continued in the possession of their mountain territory; but at length the Kandyan king, Wikrama Raja Singha, after perpetrating the most frightful atrocities on his own people, seized and murdered certain native merchants, British subjects, trading to Kandy. War followed, 1815, Jan.; Kandy was taken, and the tyrant sent as a captive to the fortress of Vellore. 1815, Mar. 2, a treaty was concluded with the native chiefs, by which the king was formally deposed, and his territories annexed to the British crown.

The island soon made rapid strides in material prosperity. Coffee plantations rapidly extended. In 1847 there were 45,000 acres in coffee, and 200,000 cwts. exported; in 1877, 272,000 acres, and 926,000 cwts. exported. A coffee blight appeared 1869, and swiftly spreading, half ruined the planters, of whom many went to California and Fiji; those who remained turned their attention to other crops; and now there are also grown tea, cinnamon, cinchona, rubber, cacao, cardamoms. In 1890, 208 vessels of 14,019 net tons were registered as belonging to C.; 191½ m. of railway were open for traffic; there were 167 post offices and 31 telegraph offices. Schools are numerous, and attended (1890) by 73,698 pupils.

See *Ceylon, Physical, Historical, and Topographical, etc.*, by Sir James Emerson Tennent (1859); *Christianity in Ceylon*, by the same author (1850); *Ceylon*, by an officer (1876); *The Statesman's Year Book* for the current year; and *Ceylon in 1883*, by John Ferguson.

CEYLONESE, n. *sē'lōn-ēz'*: the natives or inhabitants of Ceylon. CEYLONITE, n. *sē'lōn-īt*. spelled sometimes CEY-

CEYX—CHABRIAS.

LANITE, a black variety of the spinel from Ceylon, sometimes used in jewelry: see SPINEL.

CEYX: see KINGFISHER.

CEZIMBRA *sā-zēm'brā*: coast town of Portugal, about 18 m. of Lisbon. Pop. 6,000.

CHABASIE, n. *kāb'a-sī*, or CHABASITE, n. *kāb'ā-sīt* [Gr. *chabos*, narrow, compressed]: a crystal of a white or grayish color, one of the zeolite family; a hydrous silicate of alumina, lime, and potash. *Note*.—CHABASITE is also referred to Gr. *chabaz'ios*, the last of the twenty stones celebrated for their virtues in a poem ascribed to the anc. Gr. poet Orpheus.

CHABLAIS, *shā-blā'*: former division of the province of Annecy in Savoy: the ancient *Caballia Provincia*, so called from the horses raised in its mountain pastures. It was part of the kingdom of Burgundy, and was given in the 11th c. by the emperor Conrad to Humbert, first count of Savoy, one of whose descendants became count of C. 300 years later. It formed part of the dept. of Lemane under Napoleon I., was restored to Sardinia 1814, and ceded, 1860, by Victor Emmanuel with the rest of Savoy to France, in which it now forms a portion of the dept. of Haute-Savoie. Its cap. is Thonon. Area 356 sq. m. Pop. about 60,000.

CHABLIS, n. *shāb-lē'* [F., name of a village]: a white Burgundy wine.

CHABLIS, *shā-blē'*: village in France, dept. of Yonne, giving name to much esteemed white Burgundy (q.v.) wine. Pop. 2,363.

CHABOT, *shā-bo'*, PHILIPPE DE: d. 1543, June 1: French general. He was of an ancient family of Poitou, and brought up with Francis I. He defended Marseille 1524, was taken prisoner at Pavia 1525, made admiral, and sent to Italy 1529 to secure the ratification of the treaty of Chambray. He conquered part of Savoy and of Piedmont 1535, was convicted of fraud and imprisoned, but released and reinstated. C. is said to have first suggested the colonization of Canada. His monument is in the Louvre, and some of his letters, written 1525, in the national library of Paris.

CHABOUK, n. *shā-bōk'* [Pers.]: a sort of whip or lash; the punishment inflicted by the lash in Persia and China.

CHABRIAS, *kā'brī-as*: d. B.C. 357: Athenian general, inventor of the mode of receiving a charge on the left knee, with shields resting on the ground and spears couched: this was introduced when C. was helping the Boeotians against Agesilaus 378. He became prominent abt. 13 B.C. 392; defeated the Spartans at Ægina 388, and at Naxos 376; shared the command with Iphicrates and Callistratus at Corcyra; repulsed Epaminondas before Corinth; was accused of treachery with Callistratus 366 for advising the surrender of Oropus to the Thebans, and was defended by Plato Proud, luxurious, and unpopular,

he went abroad to fight for Tachos, King of Egypt, but returned on the outbreak of the social war, 357, joined Chares in command of the fleet, and was killed at the siege of Chios, disdaining to retire when his ship was disabled. His life was written by C. Nepos: his statue was erected at Athens in the posture he had devised at Thebes. Demosthenes said C. had conquered 17 cities, taken 70 vessels and 3,000 prisoners, and brought 110 talents into the Athenian treasury.

CHACK, n. *chăk*: in *Scot.*, a slight refreshment; a luncheon or informal meal; a snack.

CHACK, v. [probably formed from the sound produced by the action]: to toss up and shake the head suddenly or frequently, as the horse does to avoid the subjection of the bridle.

CHACMA: see BABOON.

CHACO, n. *chăk'ō*, or SHAKO, n. *shăk'ō* [*Hung. csako*]: in the *army*, the full-dress head-dress of nearly all the infantry.

CHACO, *chă'kō*, EL GRAN: region of S. America, bounded on the e. by the Paraguay river. The n. part, in Bolivia, is watered by the Pilcomayo, and covered with tropical vegetation, but inhabited solely by wild Indians, except a settlement made 1872 in the n.w. corner. The s. portion, in the Argentine Republic and n. and e. of the Salado river, is an arid plain, habitable only as improved by artificial irrigation. Several colonies have been settled here, and some of the natives have become partly civilized.

CHACONE, *sha-kōn'*, or CHACONNE, *sha-kōn'* [*F. chaconne*]: a kind of Spanish dance in triple time, somewhat resembling the saraband; borrowed from the Moors.

CHAD, n. *shăd*: a kind of fish: see SHAD.

CHAD, LAKE: see TCHAD.

CHAD, *chăd*, SAINT: a pupil of Aidan at Lindisfarne, England, who was bishop of York and afterward of Litchfield, in the 7th c. His day in the calendar is Mar. 2.

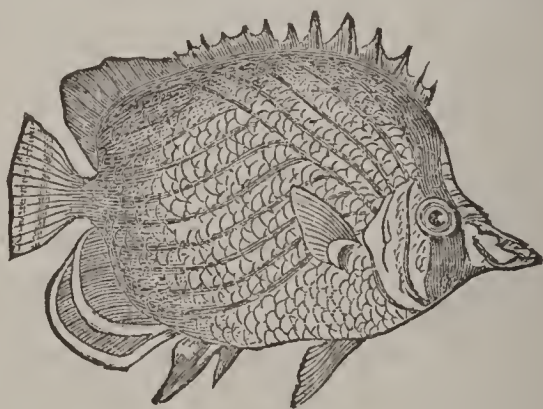
CHADBOURNE, *chăd'bûrn*, PAUL ANSEL, D.D., LL.D.: 1823, Oct. 21—1883, Feb. 23: b. North Berwick, Me. After a boyhood spent in farming, carpentry, and as a clerk, he graduated at Williams College 1848, studied theology at Freehold, N. J., taught in several places, and was licensed to preach. He became prof. of chemistry in Williams College 1853, and in Bowdoin 1859; was pres. of the Univ. of Wis. and prof. of metaphysics 1867–70; and after two years spent among the mines of the Rocky Mountains, pres. of Williams College 1872–81. He published *Relations of Nat. Hist. to Intellect, Taste, Wealth, and Religion* (1860); *Natural Theology* (1867), and *Instinct in Animals and Men* (1872)—these were lectures before the Smithsonian Institution and the Lowell Institute; *Strength of Men and Stability of Nations*, five baccalaureate sermons (1873–77), and *Hope of the Righteous* (1877). He edited *Public Service of the State of New York* (3 vols., Boston, 1881). Dr. C. was a man of remarkably varied abilities and ener-

gies. He received the degree LL.D. from Williams College 1868; D.D. from Amherst 1873. He died in New York.

CHAD'DA : see BENUWE.

CHÆRONEIA, *kěr-o-ně'a*: city of Bœotia, anc. Greece, near the Cephissus, on the borders of Phocis, noted for several important battles in the neighborhood. In B.C. 447 the Bœotians here obtained a victory over the Athenians; and in B.C. 338, Philip of Macedon signally defeated the united forces of the Athenians and Bœotians, and so crushed the liberties of Greece. A mound of earth, about a mile from the modern village of Kapurna, which occupies the site of the old city, still marks the place where the Thebans who fell in the battle were buried; and a magnificent lion, which Colonel Mure pronounced 'the most interesting sepulchral monument in Greece,' was excavated from this tumulus some years ago. At C., also, B.C. 86, Sulla defeated the generals of Mithridates. Plutarch was a native of this town. A few ancient remains are visible.

CHÆTODONTIDÆ, *kē-to-dōn'tī-dē*: family of acanthopterous fishes, nearly corresponding to the genus *Chætodon* [Gr. hair-tooth] of Linnæus; named also SQUAMIPENNES [Lat. scaly-finned], because of the most distinctive character of the family, the incrustation of the soft portions of the dorsal and anal fins, and often of the spinous parts also, with scales, the fins appearing to taper gradually out of the thickness of the body, which is in general remarkably compressed, so that, without dissection, it is impossible to tell where they begin. The scales are strongly ctenoid (q.v.). The typical genus *Chætodon*, and those



Chætodon.

most nearly allied to it, have hair-like teeth, so that their jaws resemble brushes; some fishes of the family, however, have trenchant teeth on the jaws, and some, as *Brama* (q.v.), have card-like teeth both on the jaws and palate. Most of the C. are tropical. They generally frequent rocky shores. Their colors are often extremely gay, and usually disposed rather in stripes or bands than in spots. 'The eye of man receives the greater pleasure from their contemplation, in that, being of moderate or small size, and haunting habitually the coral basins of the transparent tropical seas, they disport themselves in the beams of a vertical sun, as if desirous of exhibiting their splendid

CHÆTOPHORA—CHAFF.

liveries to the greatest advantage in the blaze of day.' Many singularities of form occur in this family, as the long slender snout of the *Chelmons*, the whip-thong-like prolongation of some of the rays of the dorsal fins in *Heniochus* and *Zanclus*, the wing-like dorsal and anal fins of *Platax*, the sharp recurved horns of the buffalo-fish (*Taurichthys*), etc. To this family belong the archer-fishes (q.v.).—The flesh of most of the C. is of very fine flavor.

CHÆTOPHORA, n. plu. *kē-tōf'ō-ră* [Gr. *chaitē*, horse hair, a horse's mane; *phorēō*, I bear]: the tubicolous and errant annelides, together with the earth-worms, etc., which have bristle-bearing foot-tubercles, or locomotive-bristles.

CHAFE, v. *chāf* [F. *échauffer*; OF. *chaufier*, to heat, to warm—from L. *calēfācērē*, to make hot: prov. F. *calfar*: It. *calefare*: comp. Sp. *chafár*, to mat down the pile of velvet]: to heat; to warm with rubbing; to perfume: N. heat by friction. CHA'FING, imp. CHAFED, pp. *chāft*. CHA'FER, n. or CHAFING-DISH, a portable grate for coals. CHA'FERY, n. *-fēr-ī*, a forge in iron-works. CHAFING-GEAR, the stuff put upon the rigging and spars to prevent their being chafed, such as mats, sinnet, spun-yarn, strands, and the like.

CHAFE, v. *chāf* [OF. *eschauffer*, to set in a chafe: Bav. *kauchen*, to breathe, to puff: It. *sborfare*, to puff with snorting]: to become heated with anger; to excite passion; to rage; to fret; to fume: N. heat; passion. CHA'FING, imp. CHAFED, pp. *chāft*.

CHAFER, n. *chā'fēr* [Ger. *käfer*; AS. *ceafer*; Dut. *kever*, a beetle]: common name of those beetles or coleopterous insects, which either in the perfect or larva state, are destructive to plants, particularly those which devour the wood, bark, or roots of trees. From these, however, it is sometimes extended to some coleopterous insects which have no such habit. The word C. is seldom used alone, but generally as part of a name with some prefix; thus, *Cock-chaffer*, *Rose-chaffer*, *Bark-chaffer*, etc.

CHAFF, v. *chāf* [Dut. *keffen*. to yap, to bark: Ger. *kaff*, idle words: but *chaff* may be considered a mere popular corruption of the verb *chafe*]: in *familiar language*, to rally one; to chatter or talk lightly. CHAFF, or CHAF'FER, n. vulgar and impertinent joking; silly banter.

CHAFF, n. *chāf* [AS. *ceaf*: Ger. *kaff*: Pers. *khah*]: the husks of grain or grasses; anything worthless; straw cut small for cattle-food. CHAF'FY, a. *-fī*, like chaff. CHAFF-LESS, a. *chāflēs*, in *OE.*, without chaff. CHAFF-CUTTER, the agricultural machine, for cutting or chopping hay or straw, not so much to facilitate mastication or digestion as to prevent animals from wasting their food. The simplest and oldest kinds are mere hand-machines with a single large knife, the hay or straw being pushed forward in a trough or box; while others are complicated, and are driven by horse, steam, or water power. CHAFF-WEED, the *bas-tard pimpernel*, *Centun'cūlus min'imūs*, ord. *Primulacēæ*.

CHAFFEE, ADNA ROMANZA: an American military officer; b. 1842, April 14. He entered the regular army, 1861; became captain, 1867. He was commissioned brig.-gen. of volunteers for the war with Spain, 1898, May 4, and became maj.-gen. on July 8 following. He commanded the troops which captured El Caney, Cuba, and afterward was chief-of-staff to both Generals Brooke and Wood, when they in turn held the post of governor-general of Cuba. He was honorably discharged under his commission of maj.-gen. of volunteers, 1899, April 13, but on the same day was reappointed a brig.-gen. of volunteers; was made a maj.-gen. of volunteers, 1900, July 10, after being chosen to command the American contingent in China. He arrived at Taku, July 18, and led the American troops, who with the allied force, entered Peking, Aug. 15, and saved the foreign legationers. He has been very popular and widely known as a dashing cavalry officer. Therefore, his appointment by the President to lead the American troops in China was most gratifying to his brother officers. General Chaffee was made governor of the Philippine Islands, 1901, June 19, and on the establishment of civil government there, 1902, July 4, was made military commander. He served in this capacity till Sept. 30 of the same year, when he returned home and became commandant of the Department of the East.

CHAFFINCH, n. *chăf'fīnsh*: a bird of the finch family, *Fringilla cœlebs*; said to be so named as delighting in *chaff*: see CHAFF 1. It is one of the most common British birds; and is probably that species of finch (q.v.) to which the name finch, now so extended in its signification, originally belonged; *fink*, the German form of the name, and *pink* and *twink*, the English provincial forms still appropriated to the C., having some resemblance of sound to its common call-note. The whole length of the C. is about six inches. The tail is very slightly forked. The male, in summer, has the top of the head and nape of the neck bluish-gray; the back, chestnut; the wings almost black, with two conspicuous white bars; the tail, nearly black. The colors of the female are much duller than those of the male. The C. is a very widely distributed species, being found in almost all parts of Europe, in some parts of Asia, in the n. of Africa, and as far west as the Azores. In the cooler northern countries, it is migratory; in more southern regions, it is stationary. Linnæus gave it the specific name *cœlebs*, from observing that the flocks congregated in winter in Sweden consisted chiefly of males, the females having, as he supposed, sought a milder climate. A partial separation of the sexes is observed also in the great winter-flocks in Britain, but it is only partial; and Yarrel thinks that the young males of the previous season, which resemble the females in plumage, are associated with them, and have been mistaken for them. The flocks seen in Britain in winter are believed to be augmented by migration from Scandinavia. The eggs are usually four or five in number, of pale purplish buff color, sparingly streaked and spotted with reddish brown. The C. feeds chiefly on insects, and does much service in summer by destroying aphides and caterpillars.

CHAFFRON—CHAGRES.

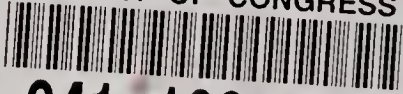
CHAFFRON, n. *chǎf'rŏn*: the same as CHANFRIN, which see.

CHAFT, n. *chǎft*, CHAFTS, n. plu. *chǎfts* [Icel. *kiaftr*, jaw, muzzle; *kiafta*, to move the jaws]: in *OE.*, the jaws.
CHAFTY, a. *chǎf'tĭ*, talkative.

CHAGRES, *châ'grēs*: river entering the Gulf of Darien on the n. side of the Isthmus of Panama, near lat. 9° 18' n. Though, toward its mouth, it varies in depth from 16 to 30 ft., it is yet, by reason at once of its rapidity and its falls, but little available for navigation. At its entrance is a port of its own name. But the town, however, and the stream have recently lost nearly all the advantages of their position, through the establishment of an inter-oceanic railway, which, on the Atlantic side, commences at Aspinwall, about eight m. to the north.

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